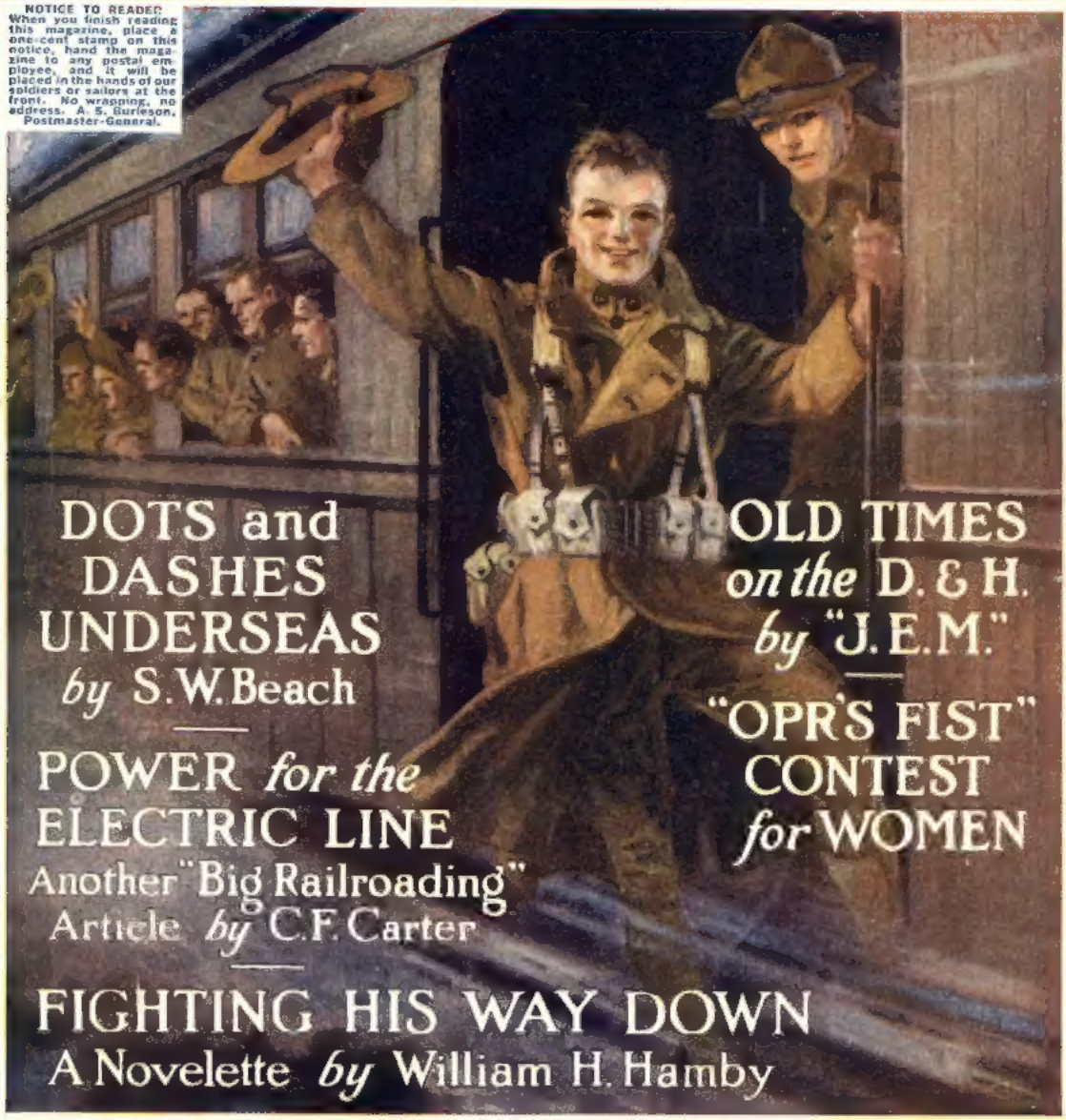
RAILROAD MAN'S MAGAZINE


NOTICE TO READER
When you finish reading this magazine, place a one-cent stamp on this notice, hand the magazine to any postal employee, and it will be placed in the hands of our soldiers or sailors at the front. No wrapping, no address. A. S. Burleson, Postmaster-General.

DOTS and DASHES UNDERSEAS *by* S. W. Beach

POWER *for the* ELECTRIC LINE
Another "Big Railroading" Article *by* C. F. Carter

FIGHTING HIS WAY DOWN
A Novelette *by* William H. Hamby

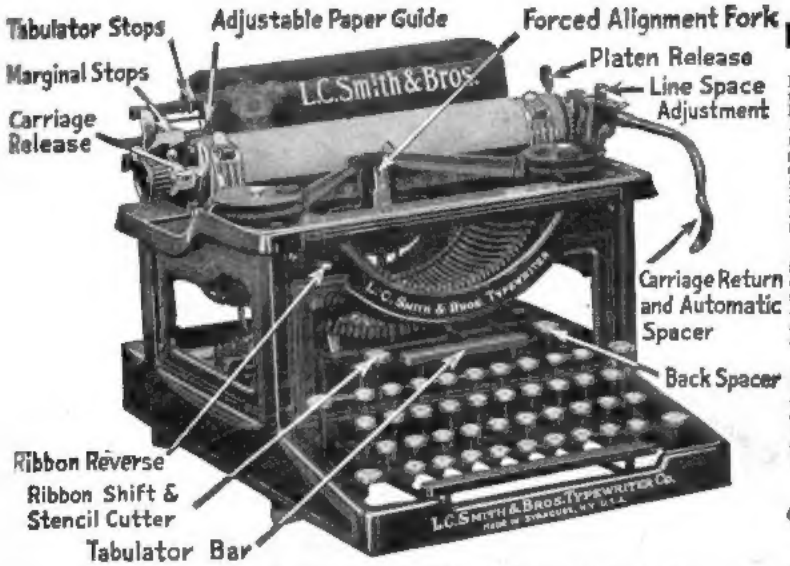
OLD TIMES *on the* D. & H. *by* "J. E. M."

"OPR'S FIST" CONTEST *for* WOMEN

10¢ PER COPY

MARCH

BY THE YEAR $1.00



I want, through this advertisement, to establish as friendly business relations with you as I possibly can. I want you to realize also, that it is my earnest effort and intention to give you full honest value for every dollar that you spend with me. This is the only way I can succeed. My advertisement has appeared in this magazine continuously for more than four years.

I am building up my business on the foundation of good value and square dealings. I am saving thousands of satisfied customers thousands of dollars, by supplying, perfect—late style—visible writing—typewriters, at remarkably low prices.

All my transactions are handled throughout by personal correspondence. I assure you every courtesy and consideration, in your dealings with me. Your order will have my prompt, careful, personal attention. I will be glad to do business with you.

Harry A Smith

ALL LATEST IMPROVEMENTS

TYPEWRITER SENSATION

Free TRIAL—Use As You Pay

Send me only $3.00 a month until the low total price of $54.30 is paid, and the machine is yours

This is absolutely the most generous typewriter offer ever made. Do not rent a machine when you can pay $3.00 a month and own one. Think of it—Buying a $100.00 machine for $54.30. Cash price, $51.00. Never before has anything like this been attempted.

STANDARD VISIBLE L. C. SMITH

Perfect machines, standard size, keyboard of standard universal arrangement—universally used in teaching the touch system. The entire line of writing completely visible at all times, has the inbuilt tabulator with billing devices, the two color ribbon—with automatic reverse and key controlled shift, automatic flexible paper feed—automatic paper fingers, the back spacer—ball bearing carriage action—ball bearing shift action—ball bearing type bars—in fact, every late style feature and modern operating convenience. Comes to you with everything complete, tools, cover, operating book and instructions, ribbon, practice paper—nothing extra to buy. **You cannot imagine the perfection of this beautiful reconstructed typewriter until you have seen it.** I have sold several thousand of these perfect latest style L. C. Smith machines at this bargain price, and every one of these thousands of satisfied customers had this beautiful, strictly up-to-date machine on five days' free trial before deciding to buy it. I will send it to you F. O. B. Chicago for five days' free trial. It will sell itself, but if you are not satisfied that this is the greatest typewriter you ever saw, you can return it at my expense. You won't want to return it after you try it—**you cannot equal this wonderful value anywhere.**

You Take No Risk—Put In Your Order *Now*

When the typewriter arrives deposit with the express agent $9.30 and take the machine for five days' trial. If you are convinced that it is the best typewriter you ever saw, keep it and send me $3.00 a month until my bargain price of $54.30 is paid. If you don't want it, return it to the express agent, receive your $9.30 and return the machine to me. I will pay the return express charges. This machine is guaranteed just as if you paid $100.00 for it. It is standard. Over one hundred thousand people own and use these typewriters and think them the best ever manufactured.

The supply at this price is very limited, the price will probably be raised when my next advertisement appears, so don't delay. Fill in the coupon today—mail to me—the typewriter will be shipped promptly. There is no red tape. I employ no solicitors—no collectors—no chattel mortgage. It is simply understood that I retain title to the machine until the full $54.30 is paid. **You cannot lose. It is the greatest typewriter opportunity you will ever have. Do not send me one cent. Get the coupon in the mails today—sure.**

H. A. SMITH
Room 318-231 N. Wells Street
CHICAGO, ILL.

Ship me the L. C. Smith F. O. B. Chicago, as described in this advertisement. I will pay you the $43.00 balance of the SPECIAL $54.30 purchase price, at the rate of $3.00 per month. The title to remain in you until fully paid for. It is understood that I have five days in which to examine and try the typewriter. If I choose not to keep it I will carefully repack it and return it to the express agent. It is understood that you give the standard guarantee for one year.

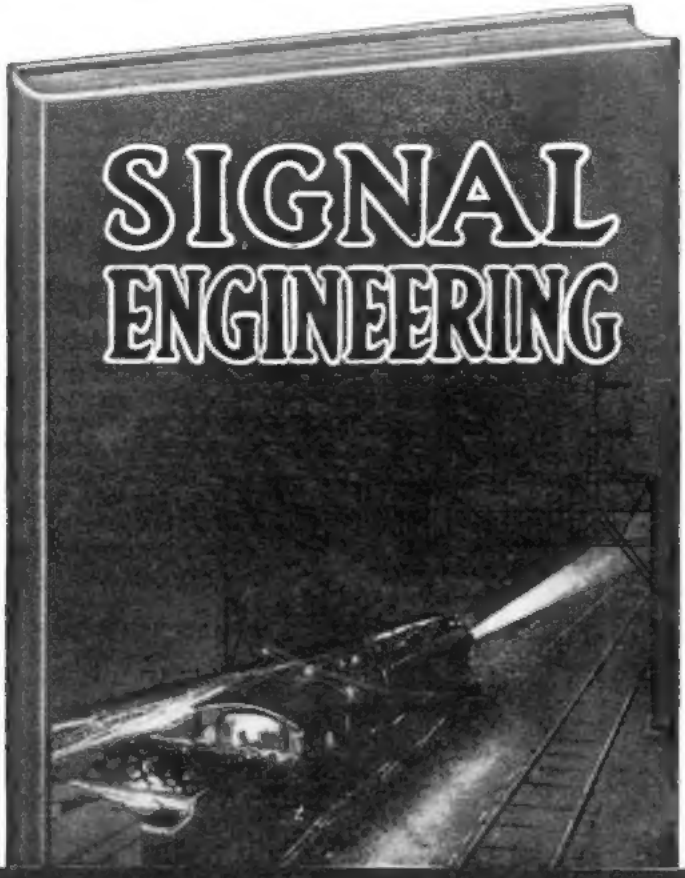
Name .....

Address .....

.....

Harry A. Smith 318-231 N. Wells St. Chicago

FC



Free Book
on Signal Engineering

THERE are thousands of miles of railroad that must be equipped with block signal systems. To superintend these installations and to maintain the systems now in use thousands of men are necessary. *Golden opportunities are offered.* Every ambitious man in America should write for the free book on Signal Engineering. It will be sent to you prepaid—without obligation. Send the coupon now.

Men Are Needed to Accept High-Salaried Positions

When you stop to consider that, at the present time, less than one-fourth of the passenger lines in this country are equipped with automatic block signal systems—and when you read that the day is fast coming when the law will compel railroads to install them, you will realize what remarkable opportunities are offered to ambitious men in the profession of Signal Engineering. The work is big—broad—high salaries are paid. $250.00 a month is an ordinary salary for a Signal Engineer.

If you join the army or navy before you have completed the course, further payments will be postponed until you return.

Send the Coupon!

Put your name and address in the coupon, or a letter or post card *now* and get the free book about Signal Engineering. Too, we will tell you how you can get the training that you need in order to become a Signal Engineer. You will be under no obligation by writing for this free book. Do it *now*.

Department of Signaling Dept. 1093 — 1810 Wilson Avenue Ravenswood Station, Chicago, Illinois

Department of Signaling
Dept. 1093—1810 Wilson Avenue
Ravenswood Station, Chicago, Illinois

Gentlemen:—Please send me absolutely free and prepaid your big new book on Signal Engineering. Also full particulars about your great special free outfit offer. It is distinctly understood that I assume no obligations of any kind.

Name .....

Address .....

Age ..... Occupation .....

6-Piece Set
Fumed Solid Oak

$1.00 A Room Full of Furniture

Send only $1.00 and we will ship you this handsome 6-piece library set. Only $1.00 down, then $2.00 per month, or only $18.90 in all. A positively staggering value, and one of the biggest bargains we have ever offered. Look at this massive set, clip the coupon below and have it shipped on approval. Then see for yourself what a beautiful set it is. If you do not like it, return it in 30 days and we will return your money. All you have to do is send the coupon with $1.00. This magnificent library set is not shown in our regular catalog. The value is so wonderful and the demand so great that there aren't enough to go around, so send today, sure. Either have set sent for you to see, or tell us to mail catalog.

6 Pieces This superb six-piece library set is made of selected solid oak throughout, finished in rich, dull waxed brown fumed oak. Large arm rocker and arm chair are 36 inches high, seats 19 x 19 inches. Sewing rocker and reception chair are 36 inches high, seats 17 x 17 inches. All four pieces are luxuriously padded, seats upholstered in brown imitation Spanish leather. Library table has 24 x 34 inch top, with roomy magazine shelf below, and beautifully designed ends. Jardiniere stand measures 17 inches high, with 12 inch top. Clip the coupon below and send it to us with $1.00, and we will ship the entire set of six pieces, subject to your approval. **No C. O. D.** Sent knocked down. Easy to set up. Shipping weight about 175 pounds. Money back if you are not pleased. **Order by No. R4349WA. Send $1.00 with order; $2.00 monthly. Price, only $18.90.**

Act Now—While This Special Offer Lasts!

Don't wait a day longer. Sit down today and send in coupon for this 6-piece Fumed Solid Oak Library Set. For a limited time only are we able to offer you this stupendous bargain. Prices, as you know, on everything are going up, up, up. It is impossible to tell just what day it will be necessary for us to increase the price of this wonderful Fumed Solid Oak Library Set. So act, but act quickly. Fill out coupon, send it to us with first small payment and we'll ship you this wonderful 6-piece Fumed Solid Oak Library Set. **Pieces not sold separately.**

Send This Coupon

Free Trial Coupon
STRAUS & SCHRAM, (Inc.)
Dept. 1273—W. 35th St., Chicago, Ill.

Enclosed find $1.00. Ship special advertised 6-Piece Fumed Oak Library Suite. I am to have 30 days' free trial. If I keep the suite I will pay you $2.00 monthly. If not satisfied, I am to return the suite within 30 days and you are to refund my money and any freight charges I paid.

( ) **6-Piece Library Set, No. R4349WA, $18.90**

Name .....

Address .....

Post Office ..... State .....

If you only want the Catalog, put X below

( ) Cream Separators ( ) Men's, Women's and Children's Clothing
( ) Furniture and Stoves ( ) Paints and Roofing ( ) Jewelry

Along with $1.00 to us now. Have this fine library set shipped on 30 days' trial. We will also send our big Bargain Catalog listing thousands of amazing bargains. Only a small first payment and balance in monthly payments for anything you want. Send coupon now.

Easy Payments!

Open an account with us. We trust honest people, no matter where you live. Send for this wonderful bargain shown above or choose from our big catalog. One price to all, cash or credit. **No discount for cash.** Not one penny extra for credit. Positively no discount from these sensational prices and **no C. O. D.**

30 Days' Trial

Our guarantee protects you. If not perfectly satisfied, return the article at our expense within 30 days and get your money back—also any freight you paid. Could anyone offer better?

Free Bargain Catalog

Send for it. Shows thousands of bargains in furniture, jewelry, carpets, rugs, curtains, silverware, **stoves**, women's, men's and children's wearing apparel. Write now.

STRAUS & SCHRAM (Inc.) Dept. 1273 West 35th Street Chicago

In answering this advertisement it is desirable that you mention RAILROAD MAN'S MAGAZINE.

RAILROAD MAN'S MAGAZINE

CONTENTS FOR MARCH, 1918

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FEATURES

DOTS AND DASHES UNDERSEAS. (Illustrated) . . . Samuel W. Beach 353
RAILS, MEET McADOO, YOUR NEW BOSS. (Illustrated) 366
OPR'S FIST CONTEST FOR WOMEN 368
BIG RAILROADING—6. Second Series. (Illustrated) . . . Charles Frederick Carter . . . 375
THE RAILROAD THAT FOUND ITSELF . . . . . Tom Shiras 394
BRIDGES TRADED IN RECORD TIME—U. P.'S GREAT ENGINEERING TRICK. (Illustrated) 408
R. R. SUPERSTITIONS, PRO AND CON:
"Proverbial Sailor Takes Second Place" . . . . . A. R. Pinci 417
"More Fetishism Among Other Trades" . . . . . Frank Kavanaugh 421
A CIVIL WAR ENGINEER. (Illustrated) . . . . . A. F. Harlow 451
OLD TIMES ON THE D. & H. . . . . "J. E. M." 458
"THE COMPANY OWNS IT—SWIPE IT!" . . . . . Daniel Dixon 474
FREAKS OF THE IRON HIGHWAY. (Illustrated) . . . J. W. Greenberg 486
RAIL STORIETTES AND THOUGHTLETS . . . . . J. E. Smith 491
"ABOUT THIS, NOW, CAR-SHORTAGE" . . . . . George Goode 497

FICTION

WHEN GRAFTER MEETS GRAFTER . . . . . William H. Seymour 369
EXIT BOOMER WILLYUM WALKER . . . . . Charles W. Tyler 389
THAT TURKEY DINNER ON THE SIDING . . . . . Charles Wesley Sanders . . . 410
JONES ON THE CALL OF THE RAIL . . . . . J. W. Earp 444
VENUS DE MILO JUNCTION . . . . . H. A. Farnham and H. P. Dowst 467
FIGHTING HIS WAY DOWN. (A Complete Novelette) . . William H. Hamby 500

DEPARTMENTS

HELP FOR MEN WHO HELP THEMSELVES. No. 90. Mechanical Stokers. (Illustrated) H. A. Kenney 401
FROGS 416
BY THE LIGHT OF THE LANTERN. (Illustrated) 427
TELEGRAPHIC AND TELEPHONIC. (Illustrated) 435
WITH THE INVENTORS. (Illustrated) 482
THE SUNNY SIDE OF THE TRACK 490
ON THE EDITORIAL CARPET 523

MISCELLANY

THE ART OF WRITING ON A MOVING TRAIN 365
SET 'EM OUT FOR THE RIP-TRACK! (Illustrated) 374
THE ENGINE. (Poem) . . . . . Frank E. Hill 387
THE MOTHER OF SIX R. R. ENGINEERS. (Illustrated) 388
HOW WE ARE DOING "OUR BIT" 393, 415, 426, 442, 473, 478, 522
THE RAILROADS ARE NOT 400
EVERYTHING IS UP BUT THE FREIGHT RATES 439
THE RAILROADESS. (Poem) . . C. W. Durr 440
HUNS WREAK HAVOC ON R. R. STATIONS. (Illustrations) 441
WELLS FARGO AS IT WAS IN 1855. (Illustrations) 443
FIRST NEW YORK CENTRAL CONDUCTOR. (Illustrated) 450
RAILROAD MEN AS FIRE-FIGHTERS. (Illustrated) 457
COUPLING 'EM UP IN PRE-AIR DAYS. (Illustrated) 466
MAKING FREIGHT-CARS BY THE GROSS. (Illustrations) 479
FROGS FROM THE TIGHT LITTLE ISLAND William J. Parry 480
THE MOTOR. (Poem) . . . . Robert D. Lokens 481
THE WELL-DRILL. (Poem) Lydia M. Dunham O'Neil 485
THE FAST FREIGHT. (Poem) . . T. J. Murray 499
SNATCHED FROM THE MAIL-CRANE . . . 524
SONGS BY BARDS OF THE RAIL 528

THE FRANK A. MUNSEY COMPANY, 280 Broadway, New York, and Temple House, Temple Avenue, E. C., London
FRANK A. MUNSEY, President RICHARD H. TITHERINGTON, Secretary CHRISTOPHER H. POPE, Treasurer

Single copies, 10 cents. By the year, $1.00 in United States, its dependencies, Mexico and Cuba; $1.50 to Canada, and $2.00 to Foreign Countries. Remittances should be made by check, express money order or postal money order. Currency should not be sent unless registered

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ELECTRICITY MADE SIMPLE

L. L. COOKE

The well-known consulting and advisory engineer, formerly member of Engineering Staffs of American Bridge Co., Pressed Steel Car Co., and Millikan Bros., great international engineers, in New York, London and So. Africa.

Let a Practical Engineer Personally Train You at Home

The demand for trained Electricians is immense. Fine positions are everywhere. Experts must be MADE—to fill them. This situation offers you the best chance you'll ever get to forge ahead QUICKLY in this greatest of all professions.

Earn $2500 to $8000 a Year!

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Proof Lessons—FREE!

QUALIFY for a splendid career through my course. It is simplified to the point of perfection. You'll enjoy it. I and my assistant engineers have worked to make it the most exact, simple, comprehensive and interesting course in America. To show you how PRACTICAL it is—and PROVE you can learn Electricity with SPEED and EASE, I will send you proof lessons—FREE OF CHARGE.

Free Electrical Outfit

Act quick and secure a big reduction in cost of tuition. If I hear from you at once I will also give you a big outfit of Standard size electrical tools, materials, etc., absolutely —FREE. Many other valuable benefits too numerous to mention. Send Coupon NOW—for full details. Don't fail—only a practical engineer can teach you the things you MUST know to succeed big—and as Chief Engineer of the Chicago Engineering Works, I am in a position to help you immensely.

USE THIS "MAR. FREE" OUTFIT and LESSON COUPON

CHIEF ENG. COOKE
Dept. 182
441 Cass Street
CHICAGO, ILL.

Sir: Send at once entirely free and fully prepaid—complete details of your great offer for March.

Name.....

Address.....

Town.....State.....

CHIEF ENGINEER COOKE

Chicago Engineering Works

Dept. 182

441 Cass Street, CHICAGO, ILL.

Classified Advertising

The Purpose of this Department

is to put the reader in touch immediately with the newest needfuls for the home, office, farm, or person; to offer, or seek, an unusual business opportunity, or to suggest a service that may be performed satisfactorily through correspondence. It will pay a housewife or business man equally well to read these advertisements carefully.

Classified Advertising Rates in The Munsey Magazines

	Line Rate.	
Munsey's Magazine	$1.50	Combination Line Rate $4.00 Less 3% cash discount
THE ARGOSY COMB'N The Argosy . . . . All-Story Weekly .	1.50	
Railroad Man's Magazine	1.00	

May Railroad Man's Magazine Forms Close March 5th.

"A New Force in Business" is a booklet that tells how to advertise successfully in the Classified Department of the Munsey Magazines. Mailed anywhere on request.

AGENTS & SALESMEN WANTED

SWELL SUIT FREE FOR 2 HOURS' WORK. Show it to your friends and make $5.60 an hour in your spare time. We show how. Costs nothing to try. Write quick for measure blank and our handy sample outfit. All Free. We deliver everything free. Look into this. Paragon Tailoring Co., Dept. 303, Chicago.

AGENTS—STEADY INCOME. Large Manufacturer of **Handkerchiefs and Dress Goods,** etc., wishes representative in each locality. Factory to consumer. Big profits. Honest goods. Whole or spare time. Credit given. Send for particulars. Freeport Mfg. Co., 41 Main Street, Brooklyn, N. Y.

RAILROAD MEN ADD MANY DOLLARS TO THEIR SALARIES during spare time selling Transparent Handled Novelty Knives with name, address, photo, lodge emblems, etc., showing under the handle. Lightning sellers. We show you how. Also want agents who can give full time. Big profits guaranteed. Novelty Cutlery Co., 111 Bar Street, Canton, Ohio.

WOULD YOU LIKE TO WEAR A BEAUTIFUL NEW SUIT, made to your own measure Free, and make $35 to $50 every week? You can be the best dressed man in your town and earn a lot of extra money if you write at once for our beautiful samples and wonderful offer. The Progress Tailoring Co., Dept. 302, Chicago.

WE START YOU IN BUSINESS, Furnishing Everything: men and women. $30.00 to $200.00 weekly operating our "New System Specialty Candy Factories," home or small room anywhere. No canvassing. Opportunity lifetime. Booklet free. Ragsdale Co., Drawer 93, East Orange, N. J.

GET THE COMMISSIONS ON WOODSTOCK TYPEWRITERS SOLD IN YOUR LOCALITY. The greatest opportunity in years to develop a prosperous business and grow with a growing concern. The **Woodstock** is a New Leader among the Standard, 42 key Typewriters, and is replacing many of the older makes because it is the latest and also sells easily against the cheaper 28 key machines; a real seller. Write now for attractive agency terms. Woodstock Typewriter Co., Dept. C1, Chicago, Ill.

1918 SPRING SUIT FREE—A WONDERFUL AMAZING OFFER—If you are a live wide-awake man, we want you to get one of our elegant spring suits, made to your measure, absolutely **Free.** You can make $25.00 extra every week and get your own clothes without cost. Write us at once and get details of this "Startling Offer." Spencer Mead Company, Dept. 1160, Chicago.

GET INTO A BIG PAYING BUSINESS FOR YOURSELF handling a very attractive specialty for cigar stands, cafes, barbers, and drug stores. Double your investment in 60 days. Dept. 2, Ad Lee Novelty Co., 28 W. Washington, Chicago.

AGENTS—$50 TO $200 WEEKLY SELLING DIRECT TO WEARER splendid line of made-to-measure suits or pants. Our famous $13.50 and $18.00 suits sell as fast as shown. Full line of samples free. Territory to right parties. Commonwealth Tailors, Dept. 1503-B, Loes Bldg., Chicago.

AGENTS—WITH EXPERIENCE—SELL TO CONSUMERS made-to measure Suits, $14.00 and $18.00. Build independent business with Big money. Outfits furnished. Midland Tailors, Department 7-15, 19 South Fifth Avenue, Chicago.

Agents To Travel By Automobile to introduce our fast selling, popular priced household necessities. The greatest line on earth. Make $10 a day. Complete outfit and automobile furnished free to workers. Write today for exclusive territory. American Products Co., 5336 3rd Street, Cincinnati, Ohio.

PERSONAL

Sufferers—Wonderful New Method that successfully treats piles and prostate disorders at home. No drugs, exercises, pain or inconvenience, yet a very rapid, positive treatment. No case too old. Enthusiastically indorsed by physicians and users. The Electrothermal Company, Box 158A, Steubenville, Ohio.

AGENTS & SALESMEN WANTED

$50 A WEEK UP. ALL THE FREE CLOTHES YOU WANT TO WEAR simply to advertise us. Write today for self measuring blanks, style chart, big book of samples etc. Send no money. A postal card brings all. We pay expressage on everything. American Woolen Mills Co., Dept. 303, Chicago.

INSYDE TYRES—Inner Armor For Auto Tires. Doubles mileage, prevents 90% of all punctures and blow outs. Thousands in use. Tremendous demand. Big sales. Liberal profits. Details free. American Automobile Accessories Co., Dept. 166, Cincinnati, O.

AGENTS—500% PROFIT. FREE SAMPLE GOLD AND Silver Sign Letters for store fronts and office windows. Anyone can put on. Big demand everywhere. Write today for liberal offer to agents. Metallic Letter Co., 410 N. Clark St., Chicago.

AGENTS WANTED—Agents Make 500 Per Cent Profit selling our Auto Monograms and Initials, Window Sign Letters, Changeable Signs, and Show Cards. 1000 Varieties. Enormous Demand. Sullivan Co., 1125 Van Buren Street, Chicago, Ill.

AMAZING, New Invention, Marvelous Adding Machine. Retails $7.50. Adds, Subtracts, Multiplies. Does work of $200 machine. Five-Year Guarantee. Offices, stores, factories buy from one to dozen. Enormous demand. Splendid profits. Write quick for protected territory. Dept. 502, Calculator Corp., Grand Rapids, Mich.

GET DAVIS' 1918 PROSPERITY OFFER—BEST IN 21 YEARS—Our Food, Soap and Toilet Goods Cut Store Prices 1-3 to 1-2. Everybody buys to lower living cost. E. M. Davis, Dept. 45, 910 Lake Street, Chicago.

CAN YOU QUALIFY TO HANDLE A DISTRIBUTING POINT on our product? The position should net $100.00 to $500.00 monthly, and is permanent. Send your application to "Salesmanager," 403 Exchange Building, Los Angeles, Calif.

OUR SIMPLEX (KEROSENE) GAS BURNERS do away with wood and coal; hundreds of pleased customers; agents coining money. Write today for exclusive territory. Simplex Gas Plants Co., Dept. H, D S. Clinton, Chicago.

Male and Female Agents everywhere can make big money selling California flower beaded necklaces. Hand made. From the land of flowers. Their attractiveness and fragrant odors create a sale wherever shown. All or spare time. Mission, *Ad 2810*, West Pico, Los Angeles, Cal.

HELP WANTED

FOREMEN, SHOPMEN, AND OFFICEMEN WANTED to work spare time as special representative of large well-known mail-order house, selling Watches, Diamonds, and Jewelry on Credit. Liberal commissions and exclusive sales rights granted. No investment or deposit required for outfit or samples. Write at once for details. Address S. D. Miller, Dept. 27, Agency Division, Miller Building, Detroit, Mich.

BE A DETECTIVE—EARN FROM $150.00 TO $300.00 PER MONTH. Travel over the world. Write C. T. Ludwig, 312 Westover Building, Kansas City, Mo.

GOVERNMENT JOBS FOR AMERICAN CITIZENS pay $900 to $1800 yearly. Prepare for coming "exams" under Former U. S. Civil Service Sec'y-Examiner. Book Free. Patterson Civil Service School, Box 1302, Rochester, N. Y.

FIREMEN, BRAKEMEN, BAGGAGEMEN, EIGHT HOURS, $140, Colored Porters wanted everywhere. Experience unnecessary. 856 Railway Bureau, East St. Louis, Ills.

YOUNG MEN WANTED ON CANADIAN RAILWAYS, Telegraphers, Agents, Freight and Ticket Clerks. Good wages. Steady employment. Positions secured. Free book 8 explains Day and Mail Courses. Write Dominion School Telegraphy and Railroading, Toronto, Ont.

Thousands Government Jobs Now Open To Men—Women, $100.00 month. Common education sufficient. Vacations. Short hours. Rapid promotion. Write immediately for free list of positions. Franklin Institute, Dept. L-2, Rochester, N. Y.

BE A DETECTIVE—EARN $150.00 TO $300.00 MONTHLY. Easy work; we show you; open to all; experience unnecessary. Full particulars mailed to you. Write Wagner, 186 East 79th St., New York, Department 151.

In answering any advertisement on this page it is desirable that you mention RAILROAD MAN'S MAGAZINE.

AERONAUTICS

BEFORE ENTERING ANY BRANCH OF AVIATION, write me for information, absolutely Free. Not connected with any correspondence course. Bud Morriss Airplane & Motor School, 1187-2848 Broadway, Chicago.

BE AN AVIATOR—LEARN TO FLY. Obtain your preparatory training at home. When this is completed we give you special low rate on actual flying lessons in the Benoist School of Aviation. Write for particulars quickly. American School of Aviation, 1093 Manhattan Building, Chicago, Ill.

SEND FOR FREE BOOK, "The Science of Aviation." Learn about the wonderful openings in this new billion dollar profession. Trained men badly needed. Big pay. We prepare you in your spare time by mail. Write now. National Aero Institute, Dept. 1073, Morton Bldg., Chicago.

AUTHORS—MANUSCRIPTS

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WANTED! YOUR IDEAS FOR PHOTOPLAYS, STORIES, etc.! Big Rewards! No experience needed. We accept scripts in any form; sell on commission. Many making money. Get Busy! Write for details. Writer's Service, Dept. 21, Auburn, N. Y.

STORIES, POEMS, PLAYS, ETC., ARE WANTED FOR PUBLICATION. Good ideas bring big money. Submit Mss. or write Literary Bureau, 112, Hannibal, Mo.

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AIREDALES AND COLLIES—GREATEST OF ALL. Pups, Grown Dogs and Brood Matrons. Strong and Healthy. Large instructive list, 5c. W. R. Watson, Box 1757, Oakland, Iowa.

LOOSE LEAF BOOKS

A GENUINE LEATHER COVER, LOOSE LEAF MEMO BOOK, 50 Sheets Paper. Your name Stamped in Gold on Cover. Postpaid 50 cents. Loose Leaf Book Co., Box 6, Station L, New York City, Department No. 1.

MOTION PICTURE PLAYS

PHOTOPLAYS WANTED BY 48 COMPANIES; $10 TO $500 EACH PAID FOR PLAYS. No correspondence course or experience needed; details sent free to beginners. Sell your ideas. Producers League, 330 Wainwright, St. Louis, Mo.

POPULAR SHEET MUSIC

A NEW SONG HIT, "MISTER HI COSTA LIVING," words and music. Lively and very catchy. Price, sent postpaid, 30c. Music by Michaud. Published by Frank Coler, Wilsonville, Nebraska.

PHONOGRAPHS

BUILD YOUR OWN PHONOGRAPH. Save big manufacturing and selling profits. We furnish mechanical parts. You make the rest. Details free. Associated Phonograph Co., Dept. 105, Cincinnati, Ohio.

STAMPS AND RARE COINS

$2 To $500 Each paid for hundreds of Coins dated before 1895. Keep all old money and send 10 cents for New Illustrated Coin Value Book, size 4x7. You may have a coin worth a large premium. Get Posted. Clarke Coin Co., Box 100, Le Roy, N. Y.

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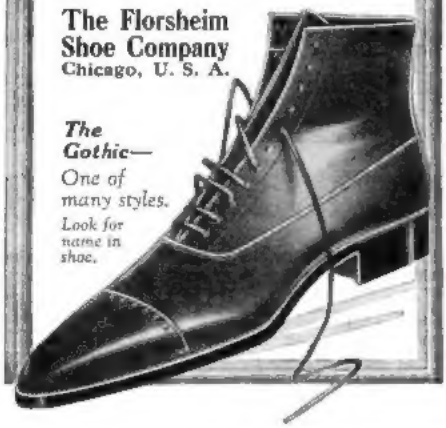

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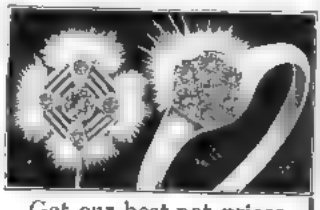

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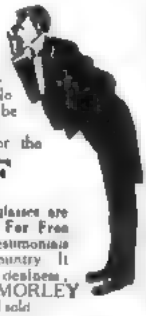

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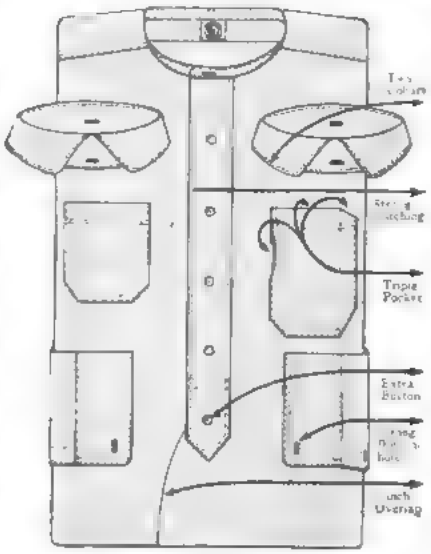

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RAILROAD MAN'S MAGAZINE

MARCH, 1918.

Vol. XXXV. No. 3.

DOTS AND DASHES UNDERSEAS.

Stories of the Submarine-Cable Game, Most Romantic and Danger-Laden Branch of All Telegraphy, Told by One Who's Been There.

FIRST TRANSOCEAN LINE WAS ELECTRICUTED.

Pioneers Didn't Know That Power Enough to Send a Message Across the Atlantic Might Be Obtained from a Battery Made by Jabbing a Silver Fork into an Orange for One Pole and a Steel Knife Poked into the Same Fruit for Another Pole.

BY SAMUEL W. BEACH.

Author of "The Dreadnought's Nerves," "Signals Used at Sea," "Uncle Sam's Telegraphy," "Secret Codes and Signals," "Simple Circuit Telegraphy Explained," "Locating Leaks in Submarine Cables," "Wireless Points and Pointers," etc.

BOYS, here's how!

Here's to the dauntless cable-ship, the intrepid crew, and the cable game, by far the most romantic, highly enticing game of all telegraphy!

The bewildering array of test apparatus, some so beautifully balanced that their indicators might quiver under the breath of a baby bee; the mighty tanks holding within them, coiled, ever ready, the big wires destined by the will of man to a lonely, vital servitude far beneath the light of day; the snorting donkey engines controlling the hemp and steel ropes with their ponderous grapples for raising the weighty conductor from the bottoms of the oceans; the broad, blunt bow whereat are the massive iron drums over which pass the ropes and cables en route into or out of the sea; the silent feud between the ship's sailors and the cable crew like the men of Limerick and Galway, who are Irishmen all, but disdain relationship—all this and

a numberless array of other things both mighty and minute grip the imagination, and the atmosphere tingles of adventure.

Yo, Ho, for the Spirit of Adventure!

Well may the spirit of adventure lurk aboard a cable-ship, and it is pertinent, too, that every man aboard be unafraid of come what may, for as a rule they sail lonesome, out-of-way routes because the big wires themselves are laid to take advantage of the best grades and conditions of the ocean floor, just as rails through the Rocky Mountains ramble and turn and twist that the big loads may the better negotiate the Great Divide.

WHEN A CABLE-SHIP STARTS OUT SHE GIVES WARNING TO PASSING CRAFT THAT SHE IS ON CABLE WORK AND THEY ARE COMPELLED BY LAW TO GIVE HER A WIDE BERTH. NOTE THE SUBSTANTIAL CONSTRUCTION OF THE BOW OF THE SHIP. THE CABLE PICKING UP AND PAYING OUT MACHINERY IS MOUNTED HERE

Of course, the submarine cable is seldom laid to such extremes of twists and turns as are the rails; but they do ramble, and many a good ship, out "shooting trouble," has plunged beneath the waves too far away from friendly steamship "lanes," to be succored.

One of the strangest of those sea tragedies was the disappearance of the "Eastern Extension" Telegraph Company's cable-ship which sailed from London, March 8, 1885, en route to the Orient. She was never seen or heard from after that. Hers was an eternal voyage o'er seas of sempiternal silence.

Two cable-ships were lost while attempting to lay a cable along the Brazilian coast in 1874. One of these, La Plata, had sailed from London, her tanks heavily stored with new cable, the load all the more weighty because tons of sea-water is always let into the tanks in order to keep the cables continually wet.

The ill-fated vessel encountered a hurricane near the island of Ushant, and sprung a leak. Wild efforts were made to lighten the ship, but the peculiar nature of her squirmy cargo prevented rapid work, and it was not long until the deadly hurricane shrieked in exultant glee that it had won its battle with man. The ship and every soul aboard her went down.

That particular Brazilian cable seemed haunted by a hoodoo, for the La Plata was the second big cable-ship lost in its construction. Only a few months previous to the La Plata disaster the telegraph ship Gomos met her end while bent upon the self-same mission.

Another Grim Sea Tragedy.

In 1873 the cable-ship Robert Lowe, belonging to the Anglo-American Telegraph Company, met doom's day off the treacherous coast of Newfoundland; while the good ship Volta plunged into Kingdom Come in the Far Eastern Archipelago back in 1887.

Nor have American telegraph ships escaped the log of old Neptune. It was only a few years ago that the U. S. S. Hooker, on cable work bent, dashed full head on into the mighty rocks of Corregidor, that

sentinel island at the entrance to Manila Bay.

And so on. Whole pages might be devoted to chronicles of cable-ship catastrophes. Theirs is an adventurous existence indeed.

Risky? Yes; but Captivating.

Ah, but a sweet, intoxicantly captivating life—sweeter than champagne, more intoxicating than pure alcohol, more captivating than the tiny tootsies of a Broadway belle!

When you step aboard a telegraph ship a mystic impulse grips you, and you feel like throwing civilization to the sharks and yelling like a savage pirate, "Yo-ho, and a bucket of blood."

But to return to the cables in the ship's tanks. Almost from the very moment of their manufacture they are kept under water; they are stored in water at the factory and leave it only during transportation to the cable-ship, where they are again plunged into water, to stay there until finally paid out over the bow into the sea.

This constant immersion prevents the gutta-percha and other insulating material about the conducting-core from drying out and cracking, or in other ways deteriorating.

The water in the ship's tank is regularly changed. Were it allowed to stand for a length of time it emits noxious odors; and, too, it is sometimes highly desirable that this water be of an approximately even temperature with the sea, because the insulating qualities of gutta-percha vary perceptibly with changes of temperature.

Cold contracts and increases insulation, while warmth acts just the reverse. If, then, the water in the tank be of an even temperature with the sea, and should that temperature happen to be a trifle warm, certain tests may ferret out weak spots in the insulation that would not otherwise be located, perhaps, until after the big wire has been laid.

Taking the Temperature of the Sea-Floor.

At times, indeed, it is of value to know the temperature of the sea at its bottom.

This may be done in several ways, but possibly the most accurate is to attach to a line which is lowered and then raised, a species of thermometer which automatically records maximum and minimum temperatures through which it passes and so stoutly built that it can resist the high pressures at the lowest depths.

Prior to laying a transoceanic cable vessels are sent out to feel out the best route by soundings, or the nautical reckonings of naval vessels are carefully scrutinized.

A mere glance at the map of the Atlantic showing its numerous submarine cable routes discloses that a large majority of them trend northerly between North America and Europe.

These are following what cable engineers know as the "telegraph plateau," ascertained through soundings made by the U. S. S. Arctic in 1856, and by the H. M. S. Cyclops during the following year, and since proved correct by numberless official and unofficial soundings.

The Atlantic's floor over this route is unusually smooth and adaptable to the reception of cables connecting the Old World with the New.

A hundred miles south of this telegraph plateau is another route discovered by the S. S. Paraday, but there are various sudden rises of the ocean floor in this route, known as the Paraday Hills, which present more or less serious obstacles as compared with the route farther north.

A Question for the *Teredo Navalis*.

It is not always preferable to choose shallow routes rather than deep ones, or warm waters instead of cold. Why?

Ask the *teredo navalis, xylophaga,* or the *limnoria lignorum.* Ask those buglets and wormlets of the deep why they so yearn to eat into submarine cables, and why they so hate cold water and why they are too cowardly to swim below a depth of around three thousand feet.

But those buglums and other wigglers of the briny are by no means the submarine cable's only enemies. Sharks often use 'em to sharpen their teeth upon, while swordfish and sawfish practise fancy thrusts for future under-the-sea duels by playing "heck" with wires of the deep.

Sharks, sword and sawfish, too, seldom venture into mighty cold water, nor do they

cherish the idea of maneuvering too far beneath the light of day.

So whenever and wherever possible, man, in his wisdom, eases his word-conductors either through bitterly cold waters or through warm waters far, as far as possible, below these wiggling, swimming enemies.

Because of market conditions it is often found wise to purchase far greater lengths of cable than immediate needs require.

Possibly so much is bought that the cable-ship's tanks cannot accommodate it, so it is paid out overboard in some friendly harbor, there to rest in its chosen element, the sea, until such time as it may be called upon to do its bit for humanity.

FISHING A CABLE UP FROM THE DEPTHS IS A MIGHTY TICKLISH JOB, FOR THERE IS ALWAYS THE DANGER OF ITS BREAKING BEFORE IT IS MADE SECURE BY ROPES, IN WHICH CASE THE WHOLE JOB MUST BE DONE OVER

The author recalls a period when there was more than fifty miles of submarine cable thus stored in a shallow nook in Manila Bay, and does not doubt that there are thousands of miles of the big conductors thus submerged in countless harbors bordering upon the seven seas.

When it is first coiled in its tank aboard the cable-ship the lower or entering end of the cable is connected to wires leading out of the tank into the electrician's test-room, wherein the latter official attaches them to delicate apparatus

Thus it will be plainly seen that after the tank is filled with coiled cable immersed in water, and when later on this cable is being slowly paid out by the ship, the tests made every few moments are through the entire quantity of cable both on board and entering the sea.

Supposing that a new cable is being laid, say, between Dapitan, island of Mindanao, and Dumaguete, island of Negros, some fifty-eight or sixty miles distant; and I may add that this is not supposition, but a chronicle of an actual event.

The magnificent telegraph ship Rizal, glistening in a coat of new white paint, and looking like an overgrown whale to the scores of minnowlike native dugouts that soon swarmed out from shore to greet her, swung gracefully into Dapitan harbor and dropped anchor.

Shore End Heavily Armored.

First the shore end of the cable, larger and more heavily armored than that portion destined for deeper water—because in nearing shore swift currents, tides, rocks, and the anchors of ships have to be contended with—was paid out from land by the ship's whaleboats, towed slowly by Peggy, the steam launch

As this mosquito fleet neared the parent ship the top end of the cable in the ship's tank was

brought out, passed two or three times around the big drum of a donkey engine, hence up to the cable deck and over the heavy revolving drum at the ship's blunt bow, and then passed downward, where it was caught by sailors in another whaleboat, who then rowed to meet Peggy and her wards.

Upon meeting—the sea was placid—the deepsea conductor was spliced to the shore end and lowered into the sea, whereupon, waiting only until the Rizal's electrician signaled that the splice tested "clear" after it entered the water, the small boats scurried to their mother ship and were hauled aboard.

It was getting dusk. The sea was subsiding as is its wont when the northeast trade-winds at that season—July—cease their frantic efforts to kick up a fuss when darkness approaches.

The big Rizal—ah, that beautiful ship—pulled up its anchors, plastered and dripping and nasty from the oozy ocean bed. She swung about, her bulldog nose due to the northward, while noisy gongs, seemingly everywhere aboard, beat frantic signal tattoos.

"Slow Speed Ahead!"

One of these told the ship's engineer to proceed at slow speed ahead; another acknowledged the command, while yet another warned the donkey engine that the ship was proceeding, and the engineer tinkled his reply.

Then the ship's engines began to throb, and even upon the second the little donkey engine began to snort and grate and rattle and grit, as its big drum began to revolve at just the speed necessary to pay out the requisite amount of cable to conform with the speed of the ship and the percentage of "slack" that the cable engineer desires.

Ensues then a comedy. The cable-ship's sailors—the Limericks we will dub them—having ceased their labor at the oars, at cleaning ship, and making things snug, are, with but the exception of a few stokers and lookouts, free to play their ukuleles and dance and sing on the quarterdeck 'neath the light of the southern cross, while the cable crew—the Galways—run here and there, sweat, stew, fuss, swear and work, work like telegraphers on bonus wires.

This is the night that the Galways work—small wonder that they little love their brethren on the quarterdeck aft! Yet sailors are they all, each with his part to play, each facing death in the selfsame manner should the On-High so ordain it.

The regal telegraph ship Rizal began its plod-like, snailish progress northward, ever northward, straight for the Negros shores.

This Op is Some Important.

An American telegraph operator had been left behind at the Dapitan cable-box, a lonesome spot there to sit, with an ordinary box relay upon his knees, his sole duty being to open his key when requested by the cable-ship, and to close it until again requested to open.

The importance of this man's duties may be well appreciated. When his key was opened there was no man-made pathway for an electrical current from the cable-ship through the cable to a ground.

Should he open his key at the command of the ship and the ship's telegraph engineer upon throwing a known quantity of electricity into the new cable find that his indicators do not show a leak, all is well; but should the needles upon the next test deflect it proves that, while no current is reaching the ground normally, still there is a leak somewhere along the length of cable that has been laid by the ship since the previous test; that is, that the current is passing through a leak to the ground.

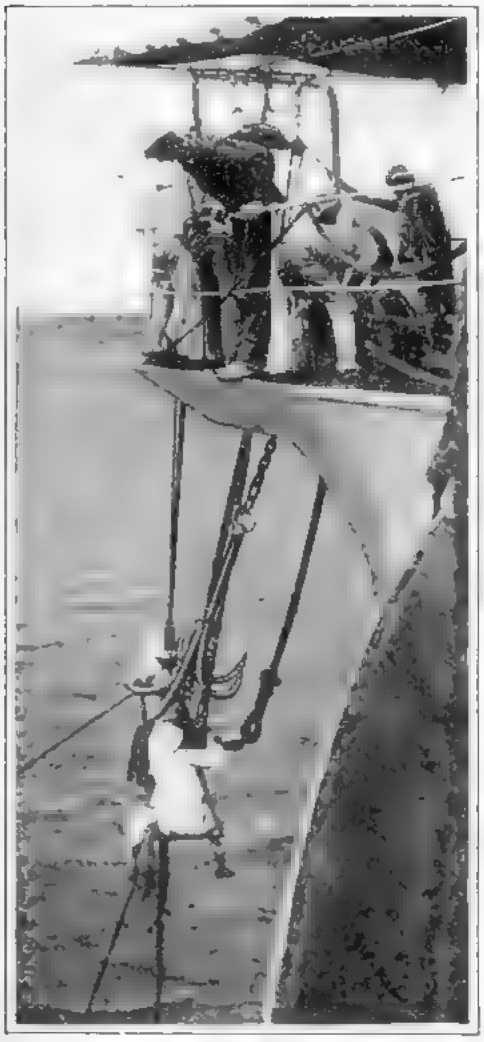
All there is to do in such a case is to "about ship," reverse donkey engine and reclaim the cable that had been laid since the previous test. This reclaimed cable is put aside, to be worked over afterward; a new piece is spliced on and the ship once more turns about and proceeds upon its work.

Tropic Call Gets Man at Dapitan.

Well, our man at Dapitan stood manfully to his task until about midnight. Then, either the enticing pianissimos of neighboring native ukuleles and friendly thump-thump of Moro tom-toms, made him leave the box relay to answer his call

of the wild, or else the mournful love sonnets of near-by tree lizards lulled him to sleep at his post—I never knew.

All I know is that when I took the electrician's watch at midnight Dapitan had fled from the map. I couldn't raise him, although I called steadily for six hours.



AS SOON AS THE CABLE IS WELL OUT OF WATER IT IS HELD UP BY A HUGE HOOK WHILE TWO CABLE SEAMEN ARE LOWERED OVER THE BOW TO FASTEN ROPES AND CHAINS

The Rizal kept plugging northward and the stars plugged as steadily to the western horizon. Every minute meant money, a wad of it, not only in cable being slipped into the sea, but in labor, in ship's fuel, and a thousand and one expenses.

I had no means of knowing whether or not, miles upon miles to our stern, there was a faulty spot in the cable we were laying, in which case we would be compelled to turn, retrace our pathway and do our work all over again, while expenses piled upon expenses. That I perspired—to put it mildly; that I loudly likened that man at Dapitan to a sleepy monkey—to keep the truth under my hat; and that I trusted that he bewinged himself toward Heaven when he died—to whisper an untruth; is but lightly and inadequately to bespeak my perturbation.

I Perturb in Many Tongues.

I perturbed in English, in pigeon Spanish, in wobbly French, and finally in straight land-line Morse. No use.

Finally the burden of responsibility drove me to "pass the buck" to my chief, the superintendent of telegraph, who was aboard. He came on deck at my summons; and so mad was he as he paced up and down that ever and anon he'd stop, and shake his fist in the general direction of Dapitan.

Meanwhile the morning sun greeted us, and soon the Rizal dropped anchor at Dumaguete.

Maybe it was the sun kissing his eyelids, or maybe it was the splash of our anchor was transmitted by mental telepathy to his slumbering nibs back there at the cable-box sixty miles astern, that awoke him. Anyway he answered his call, opened his key, and—glory, what a relief the cable tested perfect.

Landing the shore end at Dumaguete marked the finish of the job and every one was happy. A cable box was erected some hundred feet inland and the cable buried to a depth of about six feet to the edge of the low tide mark

Our work was over. The big Rizal tooted a farewell and sped away through a high sea. Now she was lighter by the weight of sixty miles of cable, and the high waves tossed her like a chip.

The sailors scampered breathlessly about strapping down all things movable, but up ahead the Galways tuned up their light guitars and sang of their maiden loves at

home in the Benguet Hills. It was their turn to make merry.

But the good ship Rizal was no longer spic and span. She had grown "whiskers" during the night—grimy, black, smeary marks from her bow to the water-line caused by the cable rubbing her sides as it was paid out.

"The cable shows a heavy leak between Legaspi and Virac. Get after it immediately."

So may read the skipper's orders. All hands are piped aboard. The vessel sails at 2.30 A.M. to-morrow.

Why not to-day?

A cable-ship earns no revenue. It is a constant expense, but this expense is far more acute while away from its home port.

So upon receiving his orders the navigator has figured just when he shall "up-anchor" in order to bring his ship over the balking cable at just about sunup, either the following morning or some following day.

My, My, Such Expenses!

It is difficult to work on merely leaking cables in the dark. From the moment of up-anchor until she heaves to at her home port again the expenses of a cable-ship's repair-trip leap apace.

A layman has no idea how expensive it is to pay a telegraph ship's upkeep while at work.

Too, it may be that after the ship has reached the vicinity of its first "job" the barometer begins to fall, the sea begins to kick up a fuss, just enough fuss to frustrate cable-work, delaying the game a day, two days or a week. Truly, one need not wonder at the seemingly exorbitant tolls on cablegrams.

Every second saved cuts a very appreciable chunk out of the ship's expenses and there cannot be any loafers aboard.

The navigator does his level best to make a bee-line for the job; the cable engineer fumes and snorts at the delay should the up grapple not bring the elusive cable with it out of the sea; the cable splicer urges his skilled little crew to redoubled efforts when the moment comes to join the big wires; the ship's chef even seems enthused by a nervous desire to conquer time, and urges his galley-boys through their duties; while down in the hold somewhere the ship's cat is ever on the *qui vive* as though sensing that her rat-raids essentially reduce expensive destruction.

Line Worth More Than Solid Copper.

It is, however, primarily in the length and class of cable expended on a job that the big cost figures. Every foot saved is worth more than its weight in solid copper.

The very first cable—mere experiments—had for conducting cores a single copper wire surrounded by decidedly crude insulation; but this core arrangement quickly proved worthless because its stiffness prevented proper following of the hills, valleys and various obstructions peculiar to the ocean floor, while to pick up such a cable for repairing was practically an impossible task.

So the solid core was abandoned in favor of a stranded core almost as pliable as new Manila rope of corresponding dimension.

The first Atlantic cable had a core of seven No. 22 copper wires, the strand totaling the diameter of No. 14 gauge, weighing 107 pounds per sea mile, insulated with three coatings of gutta-percha weighing 261 pounds per sea mile.

Then came a serving of hemp saturated with a mixture of pitch, tar, linseed oil and wax, the whole protected by a sheathing with eighteen strands, each in itself being seven No. 22 gage iron wires twisted. The completed cable weighed nearly one ton per nautical mile and had a breaking strain of over three tons.

First Transatlantic Wire Cost $1,125,000.

The vastness of all this may be grasped when it is considered that if all of the wires composing the first Atlantic cable were to be placed end to end they would girdle the earth at the equator thirteen times.

To manufacture the first submarine cable across the big pond cost $1,000 per mile, or $1,125,000 for the manufacture of the completed string, and it fluttered its last whimper within three weeks of its grand opening.

Cables of the present day are even more

A CABLE SEAMAN, ARMED WITH A HACKSAW, IS NOW LOWERED FOR THE DANGEROUS WORK OF CUTTING THE CABLE. AFTER THIS IS DONE, THE ENDS ARE HAULED ABOARD FOR TESTING.

costly. They are made better, materials cost more, and labor is far higher.

It is no wonder that every little scrap of cable is saved. These scraps are carefully stored until the cable-ship reaches its home port, whereupon the cable crew get busy upon them, testing, cutting out flaws, splicing the good portions so that they may be used again.

There is always work to be done on board a cable-ship.

Costly though it was, the first Atlantic cable taught many lessons that purged the word failure from its log. It was never definitely determined why it ceased to work so quickly after being completed, although by the mere fact that its failure was very gradual instead of abrupt the actual stoppage must have been caused by leaks, which gradually multiplied or expanded until the sea had free access to the core.

Prior to being placed aboard ship before laying, this cable was not stored in water, a vital mistake to begin with; the art of cable-splicing was in its swaddling-clothes and weak joints undoubtedly were the result; but the heavy currents of electricity used probably capped the climax.

It seems an absurdity, but it is nevertheless true that signals may be exchanged over an Atlantic cable if in perfect condition by using the "power" of a single "battery" made by jabbing a silver fork into a large juicy orange for one "pole," and a steel knife-blade poked into the same orange for the other "pole."

Of course such procedure is out of the question for regular communicating; but it illustrates how minute a current is actually necessary and to what a degree of perfection the cores of modern submarine cables are insulated.

Electricuted the First Cable.

Now see what they did to that poor little premier Atlantic cable. They shot 500 volts through it, and sometimes added insult to injury by using alternating magneto-electric currents from an induction coil five feet long, producing a potential fully equaling 2,500 volts.

No wonder the poor thing was electricuted in short order—literally and actually burned out!

Aside from the damaging effect of high-power currents, it is absolutely unnecessary to use them in submarine cable work. To illustrate this we may aptly liken the big conductor to a small water-pipe through which a tiny stream of water may slip with speed and little resistance

But if an attempt were made to force through a volume of water more than the pipe can possibly hold, it is patent that the effort would be useless, if not positively disastrous.

The greater the volume of water the greater resistance to its flow would be ex-

erted by the walls of the pipe. Too, the water would jam where it enters, but gradually reduce in force farther along.

In the early days cables were not called upon to stand such strains due to heavy traffic as they do at present, so they were built lighter. Then they were worked "single" only and slowly, while now they are mainly worked multiplex, by machine instead of hand, and at comparatively break-neck speed.

Constant currents are also foes of wires under the sea. A remarkable instance of this was manifested in 1913 while the author was connected with the telegraph system of the Philippine Islands.

Philippine Waters Are Crisscrossed.

Joining the many islands in the archipelago there are scores of submarine cables, some but a mile or so in length, while others span upward to a hundred miles. It was considered advisable to use the American "closed" circuits on land-lines wherever possible, and connecting two such closed circuits with a sixty-mile cable.

During the day, while business was heavy and the currents constantly pulsating between open and closed, this arrangement would do fairly well, as the current used was purposely cut down to a minimum and the line was actually in an open condition practically half the time.

However, during the long hours of the night while there was little or no traffic, that steady flow of electricity got in deadly work. Little leaks came in which grew, and worried the authorities in Manila.

We hated like the dickens to swap our pet closed circuits for the open variety, so the problem was passed to me:

"Is there any known means by which two closed circuits may be connected by submarine cables, the latter working as an open circuit?"

After losing both sleep and religion and ruining over two hundred sheets of paper with diagrams, I finally solved the riddle by designing sets of automatic repeaters illustrated on page 364. The *Telegraph and Telephone Age* afterward published a full-page description of these repeaters, which I venture to recapitulate.

When at rest both transmitters, A and A^1, are open, or on their back contacts While at rest the land lines are closed, and a steady current flows over them. A current is flowing into the home repeater set at C, hence through the relay R^1, and to the ground through the main battery, MB

In passing through R^1 that core is magnetized, and keeps the relay tongue upon its open, or front, contact, so that, there being now no contact at H, the coils of the transmitter T^1 are not energized. This transmitter is open, or on its back stroke, so that the contact B is closed, presenting a clear pathway for the cable, or open circuit, through the relay R to the ground.

The line is at rest, therefore the cable conveys no current, so that the relay, R, is open; its contacts, J, are apart; and there being no local current to magnetize the coils of the transmitter, T, the latter's lever is open, or upon its back contact, holding the closed circuit line closed.

Should some one down the home closed circuit line start to send, his initial movement is to open his key. The relay R^1 is demagnetized, its tongue falls back to close the contact H, which magnetizes the cores of the transmitter T^1, closing that transmitter's lever.

The contact B is now open, so that the relay R is still open, and the transmitter T still unaffected.

But when T^1 closes at D, the cable pathway is diverted through a main battery MB^1, which throws a current into the cable. At this instant the home land line is open, the submarine line is closed, and the distant land line is open because the repeaters at the distant station have responded to the closing the cable by opening the land line beyond.

When the Key Closes.

The key somewhere on the home land line closes to make a signal. The current rushes in at C, through R^1, MB, and to the ground G^2, magnetizing the core R^1, which, by pulling back the relay tongue, demagnetizes the cores of transmitter T^1 by opening the contact at H.

T^1 falls back, opening contact D, which throws off MB^1, and the cable stands clear,

while the main line at either end is closed. Think of the lines at rest again. Some one across the water opens his key to send. His repeaters reverse the action, so that a current now rushes in through the cable, through the contact B, through the relay R to the ground at G^1.

R is now magnetized, closing contact J, magnetizes the cores of transmitter T, closing its lever. This opens two sets of contacts, C and E. We will disregard E for a moment.

With the opening of C the home land line is open, just as the distant land line is open.

Were there no differential core DR above the relay R^1, the cores at R, now being disconnected from the home land line at C, would become demagnetized, the relay tongue would fly back, close H, magnetize the cores of transmitter T^1, and thus throw into the cable a double load of electrical current at MB^1.

Not only that, but, with both contacts B and C open, the whole rigamarole would be deader than a door-nail, because, no matter how much they tried, neither the cable nor the home land line currents could find a pathway.

Differential Coil's Part.

But there is a differential coil above R^1. One connection from E passes through F and the local battery G, and just before entering the differential coil DR it splits equally, one-half going to the left and back up to F, forming a merry circuit all of its own which can never be opened, while the other half goes to the right and back up to the other point of the contact E.

When E is closed, both windings of the differential coil are working and fighting each other, each trying to pass the other on the same track, as it were, so that neither of them magnetizes the coil DR.

Let us now go back to where it is said that " R is now magnetized, closing contact J, magnetizes the cores of transmitter T, closing its lever. This opens two sets of contacts, C and E."

Before E opened there was no magnetism in the differential coil DR, because both of its windings were fighting.

Now, however, E is open, so that the right-hand winding of the DR coil is open, and the left-hand winding, now enjoying full sway, hops along the core, magnetizes it, and, although the relay R^1 is dead, the relay tongue cannot fly back, because the left-hand winding of DR, by magnetizing the differential coil, pulls at the tongue and keeps it from making contact at H.

The transmitter T^1, therefore, remains open at D and closed at B, so that when the distant station closes his key to make a signal, the cable opens, as does contact J; C and E close, demagnetizing DR, but magnetizing R^1, and the home land line clicks off a dash or a dot.

Thus, it will be seen that while both land lines are closed the cable is open, and as the land lines are closed a large proportion of the time wear and tear on the cable caused by constant currents is reduced to a minimum.

By means of this unique type of repeaters, the cable is open when at rest, while both land-lines are closed. Should A, on the island of Froggo, open his key to begin sending to B, on the island of Toppo, the action automatically *closes* the cable, causing a reverse signal; but the distant repeaters again reverse the signal by opening the line beyond them.

Calculating Rate of Settlement.

The question is oft repeated as to whether a submarine cable settles to the ocean's bed immediately, as fast as the telegraph ship pays it out over the bow.

That depends both upon the speed of the ship and the amount of retardation exercised by the donkey engine as it allows the big conductor to slip over its drums, but it has been calculated that when, for instance, the depth of the sea is three miles and the cable-ship is making eight knots ahead and paying out the cable at normal speed to allow for a fair percentage of slack, the cable does not touch bottom within twenty-five miles astern, nor will any particular portion of it reach its final resting-place within two and a half hours after going over the bow.

Imagining that twenty-five miles of cable stretched aslant downward from the

LANDING THE SHORE END OF A SUBMARINE CABLE MARKS THE END OF THE JOB AND FINDS ALL HANDS QUITE HAPPY

light of day toward purgatory, it stuns the mind to conceive how a ship can uphold such a pulling weight; nor could it do so, perhaps, without listing heavily down by the bow were it not that nature provides a certain lifting power in water, so that upon entering the sea the cable ceases to be dead weight for the sea itself buoys it up to a remarkable degree.

Tremendous Grappling-Irons.

The grappling-irons used in cable work to search out the elusive conductors, maybe miles below the ship, are tremendous affairs

TESTING FOR A FAULT A CABLE END IS ABOARD AND THE DISTANCE OF THE BREAK OR LEAK FROM THE SHIP IS BEING CALCULATED

made in several styles to suit varying conditions at the bottom.

For instance, where the cable lies amid rocks or coral formations a grappler known as a "centipede" is used. This is a heavy steel shaft three or four feet in length and provided with short "feet" that bristle in all directions.

happens that all the feet of a centipede are ripped off their shaft, or the hooks of a grapple straightened completely out—no mean pull.

And so on almost without end might be chronicled the work of a cable-ship and the work of the cables themselves, and were a more competent writer than myself do the

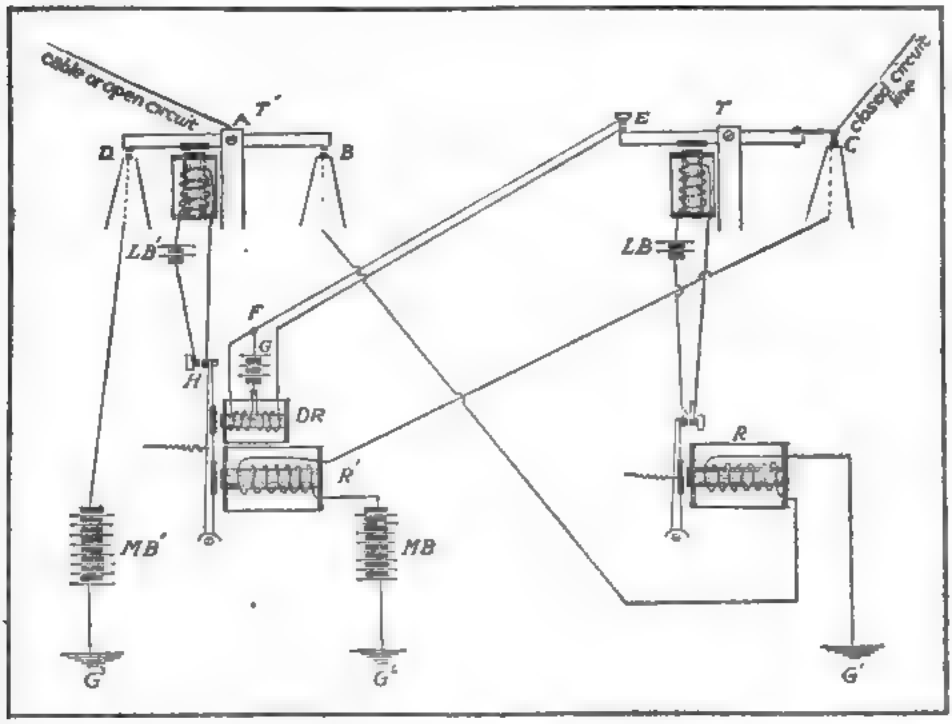


DIAGRAM OF AUTOMATIC REPEATERS, DESIGNED BY SAMUEL W BEACH WHILE IN THE PHILIPPINE ISLANDS, FOR USE SOLELY IN CONNECTING TWO CLOSED SIMPLE CIRCUIT LAND TELEGRAPH LINES BY SUBMARINE CABLE. IN STUDYING THIS DIAGRAM, REMEMBER THAT THERE ARE TWO ENDS TO A SUBMARINE CABLE AND THAT EACH END IS TO BE CONNECTED TO A LAND LINE THEREFORE, THERE MUST BE A COMPLETE SET OF REPEATERS AT EACH TERMINAL OF THE CABLE. SEE PAGES 361-2 FOR EXPLANATORY TEXT

For ordinary work, over a level, oozy bed a shaft is used which is provided with five immense hooks.

The rope to which these grapples are fastened is made of steel wires interlaced with hemp, a combination that insures an almost unbreakable line. They must be stout. They must not only be strong enough to pull the cable out of the sea from great depths, but also to withstand the pull exerted when the grapple becomes lodged among boulders.

While on a still hunt for a cable it often

writing, every word would be deeply interesting and every paragraph contain something surprising about the wires under the sea.

Nature Beat Man to It.

It has been written, "Nature is more audacious in her realities than man in his most fantastic imaginings."

How downright true that thought! It cannot be gainsaid that Nature, old as the world itself, upon the very moment of the birth of Time, provided the elements where-

by Adam might have builded an aeroplane, Noah could have constructed a submarine, Methuselah might have erected a powerful wireless or Lief, son of Eric, could have connected the Old World with the New by submarine cable.

Nature had all things thought out and the requisite ingredients furnished. She put ether where it belonged for Heinrich Hertz to create radio waves in; she concealed rubber and gutta-percha in certain trees for man to discover and wrap around wires so that he might telegraph under oceans; she wrote invisible laws whereby certain combinations of her chemicals and ores produced that strange phenomenon, electricity, and so on.

Dreamers Precede Practical Men.

Then here and there about the earth arose dreamers and explorers, followed by experimenters and finally inventors. Nature helped them all she could.

She shot lightnings that smacked of electricity; she sent forth great birds that made men yearn to emulate their flying, and great fishes to entice him beneath the waves. Yet all these things have taken thousands of years. Truly Nature has been patient. Man has been slow.

The man of each succeeding age has thought himself at the pinnacle of wisdom. Their legends show it. But the next man came along in every instance and knocked his predecessor's wisdom into a cocked hat.

Witness the words of that most noted submarine cable engineer, Charles Bright, in his admirable work, "Submarine Cables," printed in 1898—a mere handful of years ago:

"Submarine telegraphy is just one of . . . achievements of human science and perseverance which will never be forgotten. . . . Still more sensational developments of material progress in the way of communicating with our fellow men may be in store for humanity. We may learn to fly through the air on wings . . . Mr. Maxim may construct for us a new aerial leviathan, while Mr. Edison or somebody else teaches us with some new fishlike craft to cleave swiftly and noiselessly through the still depths of the ocean."

Nature must have grinned when Bright wrote those prophecies that were destined to prove so quickly fulfilled—although by other inventors—but just the same Bright struck the truth when he wrote that the submarine cable will never be forgotten even though some day it shall cease to exist.

Kipling's Poetic Tribute.

Rudyard Kipling, perchance while amuse aboard some big vessel steaming alone out on the broad sea, and thinking of those big wires maybe miles below him, in a moment of inspiration, wrote a stirring tribute to their existence:

The wrecks dissolve above us; their dust drops down from afar—
Down to the dark, to the utter dark, where blind white sea-snakes are
There is no sound, no echo of sound, in the deserts of the deep,
On the great, gray, level plains of ooze,
Where the shell-burred cables creep—
Here in the womb of the world—here on the tie-ribs of earth—
Words, and the words of men, flicker and flutter and beat.

THE ART OF WRITING ON A MOVING TRAIN.

WRITING legibly on a fast-moving train is difficult to a person unaccustomed to it, says the *Express Gazette*. The railroad conductor knows the trick of it, and manages to get along quite satisfactorily. He prefers to write in a standing position, and holds his right elbow firmly against his side. The reason for this is too much lateral movement in the trunk of the body; while standing this is more easily controlled.

When the arm swings freely, as in ordinary writing, several joints of the body are affected in the process, each of which is capable of its own motion

Holding the elbow against one's ribs "breaks" those motion tendencies, except that of the wrist, which movement is necessary in writing, and thus the pencil or pen used in writing is more easily controlled

RAILS, MEET McADOO, YOUR NEW BOSS.

President Wilson Makes the Secretary of the Treasury Head of All the Country's Steam-Carriers.

OR the first time in its history the greatest railroad system in the world bows before the will of one man. By the signing of a paper recently, officially known as a presidential proclamation, nearly two million men found themselves working for a new boss—a boss who now controls what is probably the most gigantic, single, one-time private organization in existence.

It was no great surprise to the railroad men of the country that President Wilson chose for this big job, William Gibbs McAdoo. The proposition of running a system that comprised nearly 400,000 miles of track, and had an operating revenue of more than three and a half billion dollars a year, required an astute financier. And the proposition of running it in such a way as to solve the great problems made critical by the war — coal shipment, mobilization of troops, shipping of freight generally in the quickest and most economical way—called for a man who understood railroading thoroughly.

McAdoo, Financier and Railroader.

The Secretary of the Treasury is both. From the time he was a young lawyer in Chattanooga, Tennessee, back in the early eighties, Mr. McAdoo has been interested in and affiliated with railroading. Starting out as counsel for the Central Railroad of Georgia, and the Richmond and Danville Railway Company, he later reorganized the Chattanooga Street Railway Company, and for a time was its president.

Mr. McAdoo was born in Marietta, Georgia, on October 31, 1863. When he was twenty-nine he came to New York and took up the practise of law. In all of his spare time he was studying carefully the transportation problems of the metropolis. The idea of a tunnel under the North River appealed to him strongly, and his studies strengthened his conviction that the idea was feasible.

Put Through the Hudson Tunnels.

After obtaining backing for his scheme, he organized, in 1903, the Hudson and Manhattan Railway Company, of which he was elected president. Five years later, to the amazement of the entire country, the tubes were opened to traffic. The work had cost $60,000,000.

Another important milestone in railroading was thus passed, largely through the genius of this young lawyer. In running the new road he won instant favor because of the courteous attitude he insisted on the personnel maintaining toward the traveling public. At one time he was mentioned as a possible successor of Theodore Shonts as head of New York's subway system.

When Mr. McAdoo accepted the colossal task of directing the railways he took upon his shoulders his eighth highly important assignment under the Wilson administration. For in addition to his being Secretary of the Treasury, the newly appointed rail dictator is head of the great Liberty Loan organization, and is now conducting the war savings plan, the soldiers' and sailors' insurance scheme, the new war revenue law, as well as overseeing the work of the Federal Reserve and the Farm Loan Board.

But that President Wilson thinks his able lieutenant is capable of fulfilling these important tasks is evidenced by the laudatory statement which accompanied his proclamation:

" The Secretary of War and I are agreed

ABOUT THE BUSIEST MAN IN AMERICA TO-DAY IS WILLIAM GIBBS McADOO, THE FIRST OFFICIAL DIRECTOR-GENERAL OF RAILWAYS. THE LATEST OF HIS EIGHT JOBS IS RUNNING AN ORGANIZATION THAT HAS NEARLY TWO MILLION EMPLOYEES

Photo copyrighted by Clinedinst, Washington

that, all the circumstances being taken into consideration, the best results can be obtained under the immediate executive direction of the Honorable William G. McAdoo, whose practical experience peculiarly fits him for the service, and whose authority as Secretary of the Treasury will enable him to coordinate as no other man could the many financial interests which will be involved, and which might, unless systematically directed, suffer very embarrassing entanglements."

The director-general has already appointed a railway cabinet to aid him, and is rapidly perfecting the new and powerful arm of the government as a war-winner.

OPR'S FIST CONTEST FOR WOMEN.

Handwriting Tournament Is Organized by the Railroad Man's Magazine for the Exclusive Benefit of Fair Telegraphers.

THE telegraphers' penmanship contest conducted by this magazine during the summer months of 1917 brought forth several meritorious specimens from girls and women employed in railroad and commercial telegraph service, and although none of those sent in while the contest was under way were in championship class, a number of letters received from the ladies after the contest closed brought to light the fact that many of the fair telegraphers know how to write well.

Forty years ago there was a greater proportionate number of women employed in the telegraph service than during the past twenty-five or thirty years. At the present time, owing to the necessities of war, many women are entering or reentering the service, some of them temporarily, and others with a view to remaining. On the Boston Division of the New Haven Railroad, for instance, there are now seventeen women telegraphers.

There are to-day many women telegraphers who write very creditable hands. In general their penmanship differs considerably from the closely formed loops affected by their brother telegraphers, but there are exceptions—quite a number of letters received by us during the past year from the girls were written with a relay-office swing that resembles the best work of an old-time despatcher.

Now let us see what railroad or what telegraph office in the United States or Canada has the woman telegrapher who writes the best telegraph hand.

From all of the specimens received we shall select those which, in our opinion, are the first, second, third, fourth, fifth, and sixth best, and reproduce them.

To each of the six winners we shall award one year's free subscription to the RAILROAD MAN'S MAGAZINE.

RULES OF THE WOMAN OPR'S FIST CONTEST.

The words to be written are:

> This is a specimen of penmanship written by a woman telegrapher and submitted to the editor of the Telegraph and Telephone Department of the RAILROAD MAN'S MAGAZINE in the year nineteen hundred and eighteen.

Use absolutely black ink, and a good grade of white, unlined paper.

The sheet of paper used may be any size, but the space occupied by the words of the text should not exceed seven inches by five inches.

Write your name in small letters on one corner of the reverse side of the sheet.

In preparing your copy write a dozen trial specimens and then mail the best one to Editor, Telegraph and Telephone Department, RAILROAD MAN'S MAGAZINE, No. 8 West 40th St., New York.

WHEN GRAFTER MEETS GRAFTER.

BY WILLIAM H. SEYMOUR.

**Three of the Swellest Mitt-Turners in the Biz—
And "Took" by a Pretty Jane in a Kid's Gip!**

TH' first time I ever knows that Red has a "home" is one mornin' when he cracks ta me somethin' about th' burg we was showin' in bein' only twenty miles away from his own home-town.

"Slim," he says ta me, "I have a strong yen ta put a dent in th' bank-roll fer some rattler fare an' jump out an' give th' old folks th' once over."

"Hop to it, Red," I tells him; "only I hopes that ya gets a warmer welcome than what I gets when I goes home. Take my advice an' supprise 'em; jest drop in on 'em without tippin' them off that ye're comin'. That's th' way I does it now.

"I use ta send a telegraph ta my sister an' wise her up that I was on me way; then when I gets home I finds that th' doors has a coupla bolts on 'em an' th' winders was all nailed down. Sometimes I use ta have ta jim my way in through th' skylight an' other times through th' celler winder. One time I has ta do a little second story work before I crashes inta th' fam'ly circle.

"Then when I casts my glims around th' 'dear ole home' I finds that they've yanked th' cut-glass off th' sideboard an' put th' rubber plant in th' safe. After a w'ile I gets tired of that an' now I jest drops in on 'em every coupla years or so."

"Well," says Red, "I ain't been home fer six years, so they ought ta be glad ta see me, even if th' old gent is a deacon in th' church an' thinks that circuses is promoted by th' divil!"

"Him bein' a deacon," I says, "he might croak th' fatted calf."

"He's one of them wegitarians," says Red, "but I'll take a chance, anyways."

Red pulls his freight fer th' "ole homestead" that mornin'. He makes it short an' sweet because he's back with th' show in a coupla days.

"Well," I says ta Red when I sees him, "what did th' old man have ta say ta his han'some son when he gets his first peek at him in six long 'yares'?"

"He jest gives me th' up an' down an' says: 'What's th' matter—did th' circus bust up?'

"I tells th' old gent that th' show is okay an' that I jest came home fer a visit.

"'Oh,' says he, 'I thought that maybe ya came home ta loaf!'"

"In other words, Red," I says, "ya was welcome like a skunk at a picnic!"

"You told it," says Red. "Th' only one that was glad ta see me was th' kid brother. I feeds him a lotta bull about th' swell times we has with th' show an' th' heavy dough we drags down. He has a yen ta join out, but I says, 'Nix.'

"When I starts ta come back ta th' outfit th' kid brother comes down ta th' rattler with me.

"I says, 'Good-by,' an' grabs out a seat in th' smoker. When I pulls inta this burg th' first guy I meets is th' kid.

"He tells me he rode blind baggage on th' same train an' won't go back because th' old gent would kick th' linin' outa him fer even thinkin' of troupin' with a circus. I know th' old gent like I do a deck of cards an' I can't chase th' kid back home. What'll we do with him, Slim?"

"Whad da ya mean '*we*'?" I asts him.

Red don't say nothin', but he looks like he thought that I made a bad bust, seein' that me an' him is pardners.

"Where is th' kid now?" is the next thing I asts him.

"Got him planted down ta th' railroad station," Red tells me.

"Let's go down an' have a squint at him," I says ta Red.

I glims th' kid over. He was jest a punk—about eighteen, or maybe a little older. He's a ringer fer Red, only a little redder. In fact he looks so much like Red that I falls fer him jest like I fell fer Red when I joined him out fer a pardner.

Anyways, I tells Red that maybe we can use th' kid around th' juice joint.

"It'll be softer fer him," I tells Red, "than drivin' stakes or playin' pony-punk."

"Slim an' me," Red says ta th' punk, "is goin' ta try an' make a real live candy butcher outa ya."

"I don't care what I work at," says th' punk, "I jest want ta travel with th' circus—that's all I care about."

"What's yere monniker, kid?" I asts him.

"My what?" says th' kid

"Yere name, son; yere name."

"Basil," he tells me, an' he don't bat an eyelash.

"Not a chanst, kid," I tells him; "not with this outfit. Come again. What does th' gang back home call ya?"

"Rusty," he tells me.

"Now ye're shoutin'," I says. "Rusty is good."

Fer th' next few days Rusty is a busy guy. He learns how ta make a dozen peanuts look like a bagful an' how ta make lemonade without usin' lemons. Then somethin' comes off that wises me ta th' fact that me an' Red has neglected th' main part of Rusty's edjucashum.

One mornin' before parade time I'm standin' in front of th' ducat-wagon swappin' lies with th' ticket-pedler. Along comes a canvasman what we calls "Monty" because he comes from Montana.

"Slim," says Monty, "slip us a five-spot fer this super, will ya? I'm sloughin' th' outfit ta-day an' I needs th' dough."

I takes a squint at th' watch. It ain't worth more than five, but Monty seems like a pretty good scout, so I says, "Sure," an' shoves th' super in my jeans. Then I glims th' bank roll over fer a five-spot, but I ain't got no small change. Rusty is keepin' cases on th' juice joint so I yells ta him:

"Hi, Rusty! Mitt this guy a finn outa th' damp. It's okay."

Monty wafts over ta th' joint; Rusty slips him a bill outa th' register, an' I goes along with my spiel ta th' ducat seller.

That night when me an' Red is countin' up th' shekels we gets a jolt when we finds that we're five bucks short. Red ain't nicked th' damp fer any coin that day, neither has I, so we asts Rusty what he knows.

"Th' only money I paid out," he tells us, "is th' finn that Slim told me ta give ta one of th' canvasmen.

"That's okay," I says. "We've got that figured in; but we're shy another finn besides that one."

"Another ten dollars?" asts Rusty.

"Whad da ya mean—ten dollars?" says Red. "A finn is five dollars."

"Oh," says Rusty, "I can explain it now! Slim says ta me:

"'Mitt this guy a finn outa th' damp.'

"I knew what 'mitt' meant, an' I knew that th' 'damp' was th' cash register, but I wasn't sure about th' 'finn.' When th' canvasman came over fer th' money I says ta him:

"'How much is a finn?'

"'Ten dollars,' he says, an' I gave it to him.

"He swindled me outa five dollars," says th' kid.

"No he didn't," I growls. "He gipped ya fer a finn. Ya got ta learn ta talk an' savvy English if ya expect ta stay 'with it.'"

"Ya might as well begin right now," says Red, "an' learn how ta talk about coin. Any kinda coin is dough, kale, velvet, sugar, filthy stuff, gelt, jack, an' they is a hundred other names fer it, but these will do fer an opener.

"A meg is a penny," Red goes on; "a jit is a nickel; a dime is either a deemer or a thin one; two bits an' a cuter means a quarter; fifty cents is half a case or four bits; a dollar is a caser, a buck, a bone, a bean, an iron man, one seed, an ace; two

dollars is a deuce; an' I guess ya know what a five is, don't ya, kid?"

"You bet I do!" says th' kid. "An' I guess that I can remember all them other names too."

"Well, Rusty," I tells him, "here's a few more words ta remember, an' these is only samples, because they is thousan's more fer ya ta learn before ye're a regular honest-ta-gosh trouper!

"Ta begin with," I says. "Any kind of a policeman is a cop, a bull, a dick, a tin star, or a John Law. Ya'll hear them words a lot in th' show biz'ness, Rusty.

"Another thing ta remember, Rusty, is that any guy that ain't in in th' graft is called a sap, a yap, a hick, or a sucker. It all depends upon what kinda of a graft ya have an' what part of th' country ye're workin'.

"Or ya can say 'chump' because it don't make any difference whether ye're peddlin' juice with a circus or auctionin' jewelry on Broadway, or jest unloadin' pants-hangers on Hanover Street in Beanville, ya can always speak of any guy in th' crowd that's listenin' ta yere spiel as bein' a chump; that is, when ye're talkin' ta some other guy that's in th' graft. Da ya have me?"

"I have ya," says th' kid. "Here's somethin' that I want ta ast ya. Last night I was walkin' past th' roulette wheel an' one of th' guys that runs it says ta th' other guy:

"'Owslay th' ointjay th' ickday is comin'.'

"What does that mean, Slim?"

"That means:

"'Slowse th' joint; th' dick is comin'.'

"They ain't a guy in ten thousan' what would get hep ta that. Can ya figure it out now, Rusty?"

Th' kid thinks a w'ile, an' then he says he thinks he has th' answer.

"Ya take th' first letter of certain words," says Rusty, "an' ya add 'ay' ta it, then put it on th' end of th' word."

"That's th' dope," I laffs; "now can ya say my name in this line of chatter?"

"Imslay," he says.

"Right again," I laffs; "you'll be a hep guy in a little w'ile. When ya hear an earful of chatter that ya can't dope out, jest ast me or Red fer th' info. Don't ast any of th' bunch because ye're a rookie an' they're liable ta give ya a bum steer like that Montana guy put acrosst."

Rusty keeps me an' Red busy puttin' him hep ta all kinds of circus chatter, an' it ain't long before th' kid can spill th' patter 'most as good as me an' Red.

Then I thinks that it's about time fer him ta learn how ta work th' yaps in th' audience; so one afternoon I grabs a basket of pop-corn an' tells him ta foller me round with another basket an' keep his lamps open w'ile I works th' seats in th' big top. I unloads both baskets, an' then I asts him if he got hep ta any of th' stuff I pulls on th' suckers from th' tall sticks.

"Sure," he tells me; "but th' stunt I like th' best is that one ya put over on th' tightwad that wasn't goin' ta buy any pop-corn fer them six kids he has with him. I watched ya pass him an' then come back when he wasn't lookin' an' shove a package inta th' kids' mitts.

"I see ya wait until they had bust th' wrapper an' took a coupla chews, an' when ya taps the tightwad on th' arm an' ast him fer th' thirty megs I thought he'd punch ya. Was he sore, Slim?"

"Not very," I says. "He knew I'd tricked him an' he couldn't blame th' kids. It's an' old stunt but it always works."

"There's one thing I can't figure," says Rusty, "an' that is why ya always had ta count th' change twice if a yap gave a bill ta change. Ya seemed ta make a mistake every time."

"Rusty," I laffs, "Red an' me grabs off more dough makin' them 'mistakes' than we does on th' slum we peddles."

"How's that, Slim?" says th' kid. "Shoot us th' slum we peddles."

"Well," I says, "s'pose a yap slips me a case note an' buys one package of pop-corn. I always pass him ninety cents—a coupla two-bit pieces an' th' rest in nickels—then I stall right there till he counts th' coin an' tells me he's a jit shy.

"I ast him ta let me take another squint an' I holds out my right mitt. Th' sucker spills th' ninety megs inta my fist. I counts it inta my left mitt an' tell him he's right.

"Then I digs inta my jeans an' drop another jit inta th' pile, makin' ninety-five cents. Next I turns my left mitt over an' dumps th' coin inta th' sucker's palm. He shoves it inta his kick. Now I can reach fer my own pocket an' drop th' two quarters that I held out between th' first an' third fingers. That's what we calls 'turnin' th' mitt.' Da ya get it, Rusty?"

"Yes," says th' kid; "but I can't see why th' sucker don't count th' coin th' second time."

"Well," I tells th' kid, "th' only way I can dope it out is like this: When a yap comes ta th' show he expects ta be shortchanged. He's watchin' fer it an' ketches me when I counts him short th' first time

"Then he thinks that he's showed me what a smart guy he is, an' when I counts th' coin th' second time right in front of his glims he *knows* it's right. Ninety-nine times outa a hundred th' sucker never counts it th' second time. When he does ya have a squawk ta square."

"Da you an' Red have many squawks?" Rusty says.

"Not many," I tells him. "We usually beats them to it. When th' sucker starts ta count th' second time we grabs his mitt an' tells him we thinks we give him too much. We gets th' coin from him an' dumps it inta th' left mitt, where we still holds th' two quarters what we was goin' ta cop.

"We counts again; th' change is okay, an' we gives it *all* ta him this time. Never put yere hands near yere pockets until th' sucker has gone south with th' change; jest keep what ya've held out in yere mitt in case of trouble."

"I'll have ta practise that one," says Rusty.

"Don't let th' yaps trip ya up too often in th' same burg or these tin-star dicks is liable ta throw ya in th' howse-gow an' chuck th' key away."

When th' kid gets so's he kin turn his mitt, Red an' me wises him ta one we calls "th' blow." This one works best on a windy day, an' it's got ta be worked over th' counter. It takes two guys ta pull it.

"I'm behind th' joint; Red is in front drinkin' juice like he never see me before. Along comes a coupla hicks. One of them lays a finn on th' counter. Th' two yaps is laffin' an' talkin'; they ain't watchin' Red or th' finn.

"Red blows on th' counter an' lifts th' finn over behind th' joint. I'm busy with some more yaps, but I picks up th' bill an' throws it back on th' counter an' goes along with my work.

"Next I comes to th' two yaps that put up th' five-spot. Th' finn has changed to a deuce. Th' sucker says he thinks he shoved up a five. He asts th' guy standin' near him if he noticed what it was. Th' guy is Red, an' he says two dollars.

"Some of th' towners say it was a two-spot they saw, but them yaps never really noticed th' coin until I tossed it back when I picked it up. Anyways, I tells th' suckers that it don't make no difference ta me; I jest saw th' bill blow away an' picked it up; I don't know where it came from or who owns it

"Of course them yaps don't think that me an' Red is pardners an' that I was framed fer th' switch. All ya got ta do is have a deuce planted in th' grass an' smother th' finn in yere towel."

After Rusty gets hep ta th' blow I stakes him ta one we call 'th' push.' Red an' me use ta work it a mile a minute.

"Rusty," I says, "this is a tough one ta square if th' sucker gets hep ta ya. I works it like this. S'pose a yap buys a glass of juice an' slips me anythin' bigger than a case note—fer instance, we'll say it's a ten-spot.

"As soon as I gets th' bill I folds it th' long way down th' middle. Th' yap starts ta lick up th' juice. I folds th' bill again, crossways this time. Pretty soon I has th' bill folded up until it ain't no bigger round than a lead-pencil.

"When th' yap tilts his head back ta drain th' glass, I tells him that I can't make th' change, but that he can prob'ly break th' bill some place else around th' show, an' then he can pay me fer th' juice. I pushes th' bill back ta him all folded up, an' th' sucker shoves it in his kick. He never shows up ta pay me fer th' juice; he thinks he's trimmed me fer a jit, but really he's paid nine bucks fer it."

"How's that?" says Rusty.

"Well, kid," I tells him, "ya see I was framed with a case note in th' palm of me mitt. Th' caser is folded jest like th' ten-spot, an' when th' yap drains th' glass I switches th' bills. Simple, isn't it?"

"Don't th' sucker ever unfold th' bill?" asts th' kid.

"About once or twice a season ye're liable ta have that happen; jest laff an' tell him that ya made a slight mistake, an' give him back his ten. Some suckers wants ta fight; an' if they do, be sure ta hit first an' hit hard."

There's about four thousan' ways of trimmin' a yap; me an' Red knows thirty-seven hundred of them. We puts Rusty hep ta about every kind of a graft that was ever invented. But even so, they is always a chanst ta get wise ta a new game like th' three of us gets wise ta one day. It comes off like this:

I'm checkin' up th' bankroll in the priv'-lege-car one night an' I finds that we're thirty big iron men ta th' bad. I asts Red an' Rusty what they konws. Rusty thinks; then he kicks in with th' answer:

"W'ile I was workin' alone in front of th' joint this noon a swell-lookin' little jane blows up an' asts me fer a glass of juice. She lays down a twenty-dollar bill; I ain't got th' heart ta hold out on her because she's so young an' pretty.

"I puts th' twenty in th' damp an' slips her a ten-spot, nine case-notes, an' ninety-five megs in change. Th' dough is layin' on th' counter; th' little jane opens her hand bag ta pack th' stuff away; she picks out th' ten-spot an' plants it in th' poke. W'ile she's doin' this she finds a jit in her bag that she didn't know she had.

"'Oh,' she says, 'here's a nickel!'

"Then she lays it down beside th' rest of th' coin.

"'That makes ten dollars,' she tells me. 'Can you give me a ten-dollar bill fer this an' I won't be robbin' you of your small bills, then?'

"'Sure,' I tells her; 'anythin' ta please th' ladies.'

"Then I lays down a ten-spot with th' rest of th' dough. She gives me a sweet smile that makes me dizzy fer a minute. Then she counts th' coin over. They is twenty bucks there.

"'Could you let me have that twenty-dollar bill in exchange fer this?' she asts me.

"'With pleasure,' I says; "an' I give her th' twenty an' puts th' twenty dollars change back in th' drawer. She gave me such a hypnertizin' smile that I fergets all about th' first ten-spot that she tucked in her bag."

"But," says Rusty as he closes his spiel, "that only accounts fer ten bucks, an' you say that you're shy thirty, Slim."

I looks at Red an' he is turnin' red an' white in turns.

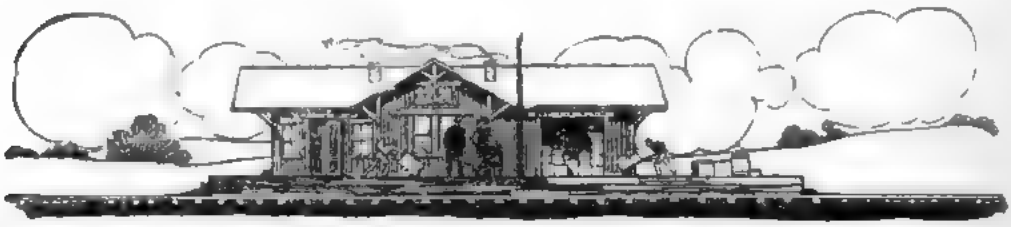
"Red," I says, "by any freak of chance did *you* happen ta change a twenty fer any swell-lookin' queen ta-day?"

"What if I did?" Red growls. "We'd still have another ten-spot ta account fer."

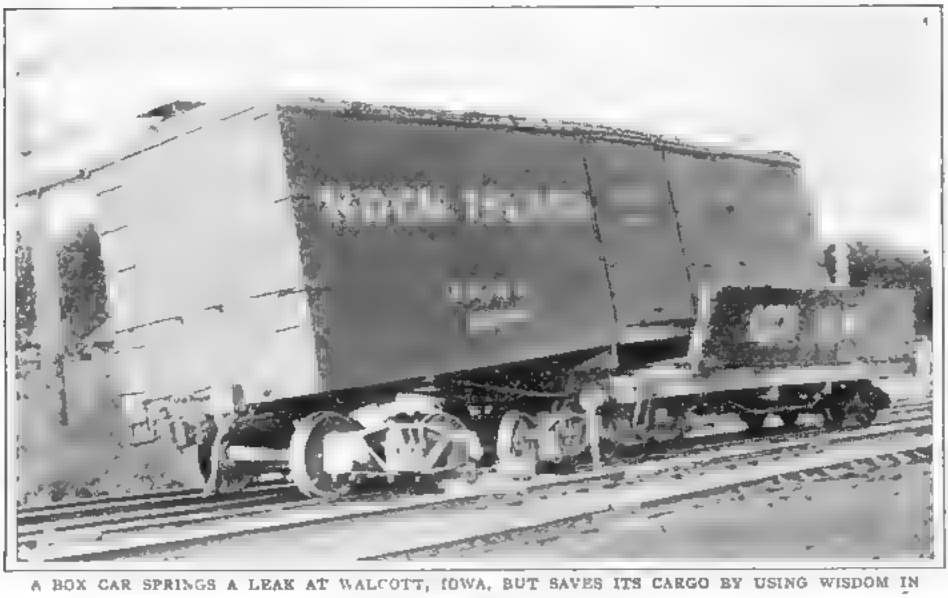
I didn't say nothin' more. No guy likes ta own up that he's been a sucker. Ya see, I fell fer that same little jane myself. She jest leaned over th' counter an' smiled at me.

I gets a whiff of th' swell colonery outa her hair an' I fergets all about th' first ten-spot that she planted in her bag jest like Red an' Rusty did.

Can ya pitcher how th' three of us felt—three of th' swellest grafters in th' biz? An' that little jane took us fer ten bucks apiece in a game that a baby should ought ta get hep ta!



SET 'EM OUT FOR THE RIP-TRACK!

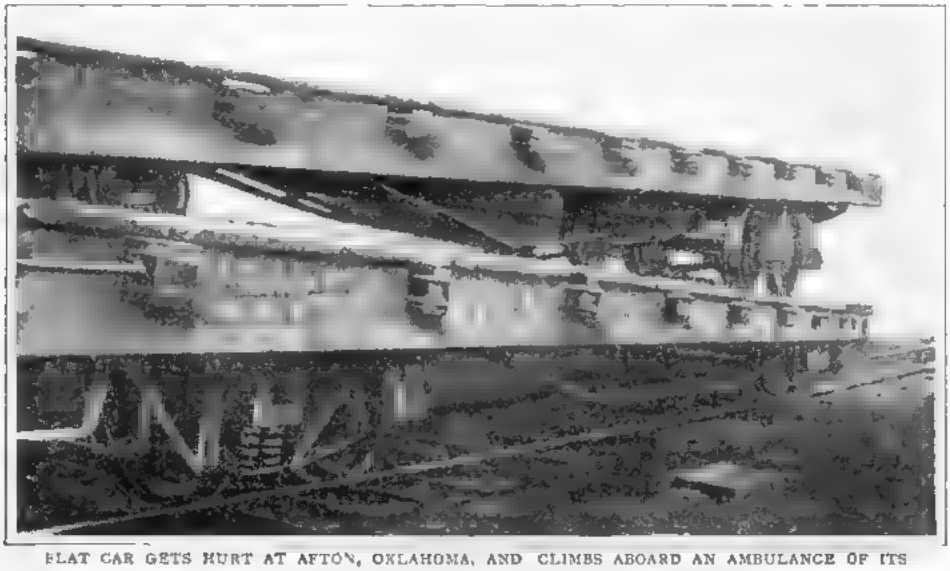


A BOX CAR SPRINGS A LEAK AT WALCOTT, IOWA, BUT SAVES ITS CARGO BY USING WISDOM IN FINDING A RESTING PLACE

THE unfortunate box car shown in the upper illustration was loaded with oats, but in the course of the accident it used good judgment enough to find a comfortable resting place in the gondola, and only about 2,000 pounds of its consist leaked out.

The curious accident shown below happened when a draw-bar dropped on one flat-car, causing it to climb on top of another flat, and loading it so perfectly that it was sent to the shops without any further shifting.

The box-car incident occurred on the main line of the Chicago, Rock Island and Pacific, at Walcott, Iowa, while the flat-car mishap took place in the Afton, Oklahoma, yards of the Frisco lines.



FLAT CAR GETS HURT AT AFTON, OKLAHOMA, AND CLIMBS ABOARD AN AMBULANCE OF ITS OWN CHOOSING, WHICH CARRIES IT TO THE CAR HOSPITAL

BIG RAILROADING—6.

SECOND SERIES.

MIRACULOUS MANUFACTURE OF RAIL GOLIATHS, AND OF MACHINERY TO GENERATE "JUICE" WHICH RUNS THEM.

PRODUCTS MADE WITH SUCH TITANIC TOOLS AS A PLANER WITH A 62-FOOT BED AND TEETH THAT RIP THROUGH STEEL AT THE RATE OF 36 FEET A MINUTE—NEXT STEP FORESEEN IS ERECTION OF STEAM POWER PLANTS NEAR COAL MINES TO TURN OUT ELECTRICITY FOR ALL IMPORTANT ROADS NORTH OF THE OHIO AND EAST OF THE MISSISSIPPI.

BY CHARLES FREDERICK CARTER,

Author of "When Railroads Were New."

SOMEWHERE in the city of twenty-four thousand inhabitants during working hours, constituting the Schenectady works of the General Electric Company, is a building, ample for a regiment's maneuvers if it were not stuffed with machinery, in the floor of which is set a steel disk on which it would be feasible to fasten a two-story house of rather more than average size.

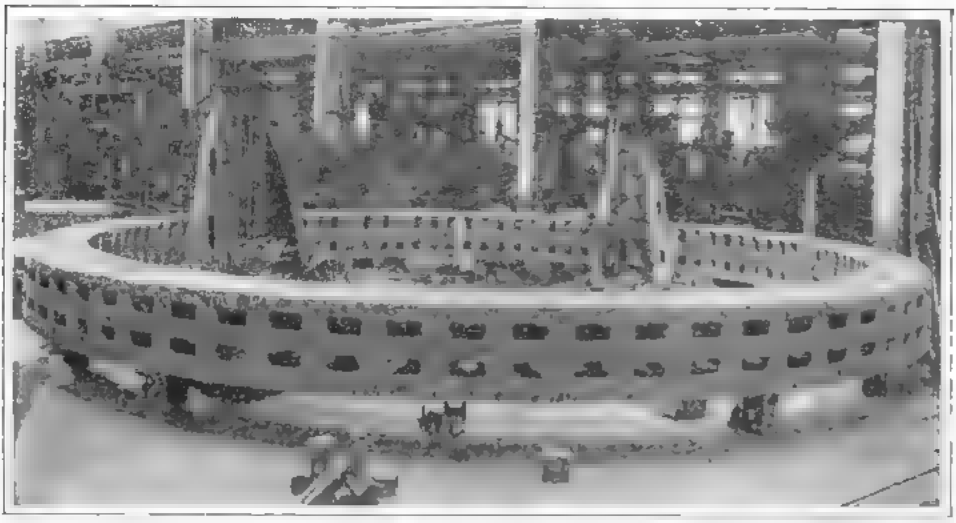
The cutting tools and other accessories with which the disk is equipped are so accurately adjusted and under such perfect control that it would be possible to use them to wash the windows of the house after it had been placed in position; although a rag employed in the good old-fashioned way would probably be more satisfactory to all concerned, everything being considered.

In hide-bound technical phraseology this megatherium of a machine is called a "boring-mill"; although if it were only a dinky little affair incapable of taking anything larger than a foot wide it would still be a "boring-mill" just the same.

A steel casting to be bored is fastened to the disk, which is then turned by a forty horse-power motor at the rate of a revolution in eight minutes—or it may be speeded up to as much as a revolution and a half a minute—whereupon the cutting-tools, held by boring-heads in an outer ring which is fixed to the floor, bite away the steel in shavings from one-thirty-second of an inch to an inch and a half in thickness. The tallest piece of work handled in this boring-mill up to the hour of going to press was twenty feet high, although that limit might be stretched upon occasion; the largest was fifty feet in diameter; the heaviest weighed two hundred tons.

Giant-Size Tools Only.

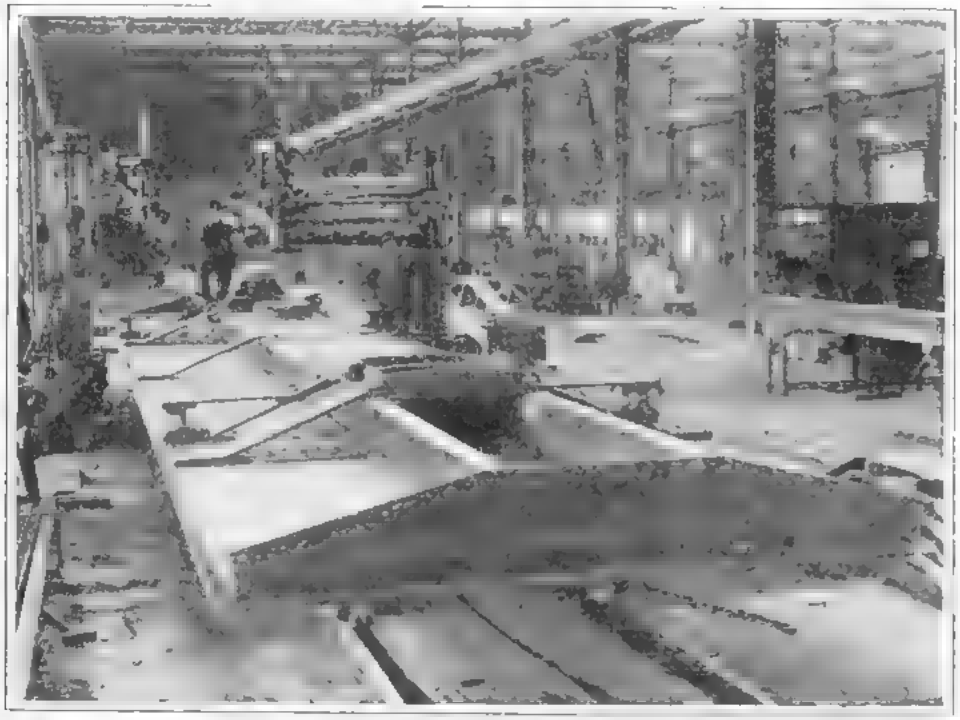
A Sabbath day's journey beyond, but under the same roof, is the teammate for this boring-mill, a planer the bed of which is longer than from the pitcher's box to the home plate; or 62 feet, if your base-



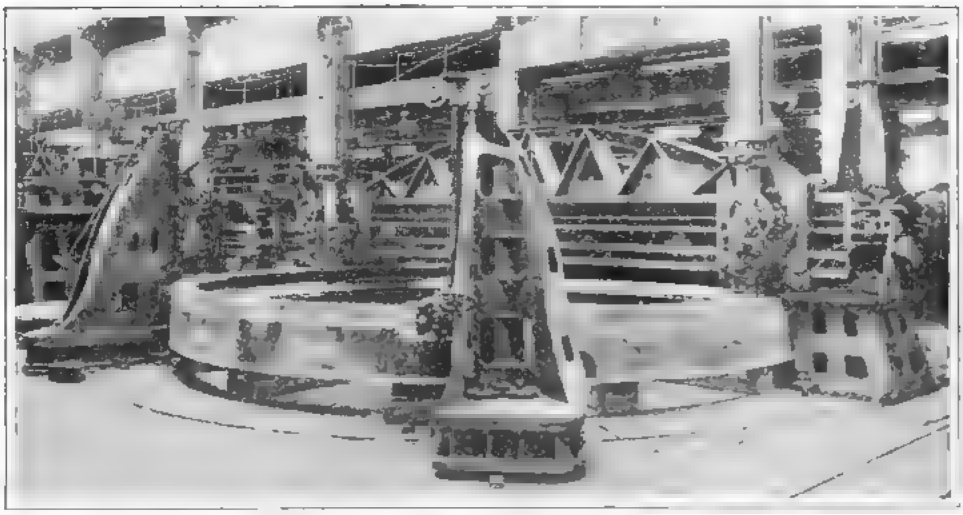
CUTE LITTLE RING—ONLY 40 FEET IN DIAMETER, BUT BY FASTENING IT TO THE STEEL FLOOR AND REVOLVING INSIDE OF IT THE BOSS OF ALL THE BORING MILLS HAS NO DIFFICULTY IN HANDLING IT

ball education has been neglected The planer is 12 feet wide and 16 feet high, and weighs 413,000 pounds. Five auxiliary motors are required to manipulate it, while its cutting-tools plow through sheets of solid steel at speeds that range anywhere from eighteen to thirty-six feet a minute

Electric locomotives have not yet attained a size requiring the employment of such colossal machinery in their manufac



WHEN THIS STEEL PLATFORM WITH ITS SILLS AND CROSS-BEAMS IS TURNED T'OTHER SIDE UP IT WILL FORM THE FLOOR OF ONE OF THE HALVES OF AN ELECTRIC LOCOMOTIVE



ON THIS MEGATHERIUM OF A BORING-MILL A TWO-STORY HOUSE COULD BE FASTENED. JUST NOW IT IS BORING A REVOLVING FIELD RING FOR AN ELECTRIC GENERATOR. THE RING IS 30 FEET 6 INCHES IN DIAMETER AND WEIGHS 34½ TONS.

ture; nevertheless these machines were called into being by the electric locomotive and its little brother, the electric motor-car.

For it must be remembered that an electric locomotive is not a manufacturer of power like its steam driven prototype, but is merely a commission merchant, receiving over the wire consignments of power produced elsewhere which it delivers in job

LOOKING DOWN ON THE ERECTING BAY AT THE ERIE WORKS OF THE GENERAL ELECTRIC COMPANY, WHERE VARIOUS TYPES OF ELECTRIC LOCOMOTIVES ARE ASSEMBLED

lots as required, less the customary percentage. Paraphrasing the story of the justly celebrated House That Jack Built, these machines construct the engines that produce the power that runs the electric locomotives that haul the trains that you cannot get passes on as you once could in days of delightful memory.

Last May these two machines did their bit in producing a Curtis steam turbine of 60,000 kilowatts, or 80,000 horse-power, the largest steam engine the world has yet seen, to generate power for an electric railroad.

The machines and their product serve the further purpose of creating in the minds of those privileged to see them a greater respect for the electric locomotive and a more vivid realization of the giant strides with which the science and art of electric railroading are advancing. Additional first aid to appreciation of electric railroad progress is rendered by the knowledge that more than four billion dollars are invested in electric street and interurban railroads, and that 2,500 miles of trunk-line railroad in the United States had been changed from steam to electric operation up to the beginning of 1917.

Continuing the prolog to a respectful glimpse at electric locomotives in the building, W. B. Potter, Chief Electrical Engineer of the Locomotive Department of the General Electric Company, said, in substance:

Power-Plants Near Coal-Mines.

"The next step in the development of American railroads will be the building of steam power-plants near coal-mines, where the haul of fuel will be reduced to its lowest terms, to generate electricity to operate all the important railroads north of the Ohio and east of the Mississippi.

"Electrification of steam roads has been such an unqualified success wherever it has been tried that the only questions to be considered are whether the volume of traffic and operating conditions warrant the improvement and whether money to pay for it can be raised.

"The electrification of 440 miles of the Chicago, Milwaukee and St. Paul across the Rocky Mountains was such a brilliant success that in January, 1917, the Board of Directors voted to extend the electric zone from Othello, Washington, to the Pacific Coast, about two hundred and fifty miles, at a cost of six million two hundred and fifty thousand dollars, the extension to be in operation some time during 1918.

"This will make a total of about 690 miles, the distance between New York and Cleveland, of electrically operated transcontinental railroad. The 225 miles between Avery, Idaho, the western end of the present electric zone, and Othello, will continue to be operated by steam for the present because this section has easy grades and few curves and hence is adapted to the limitations of the steam locomotive.

Many Factors in Electrification.

"For the big trunk lines, crowded to the limit of their capacity, the desirability of electrification is already determined; and so they have only to consider the financial problem involved. Even single-track lines are confronted with the problem of electrification as soon as their traffic becomes dense. If their tracks are ample and rolling-stock abundant electrification might not pay; but if the limit of capacity has been reached it may be cheaper to electrify than to double-track.

"For electric operation very greatly increase the capacity of a road. Electric locomotives haul much heavier trains at higher speed and are more dependable in maintaining schedules. The Milwaukee road has found that electric operation over two divisions in the Rocky Mountains reduced the time of passenger-trains from 12 to 16 hours to 7 to 10 hours, and also eliminated delays. Freight-trains have been much increased in tonnage, time has been reduced and delays have been done away with.

"In winter the problem of the steam locomotive is to keep hot. It is so susceptible to cold that in severe weather it is necessary to reduce the tonnage, sometimes one-half.

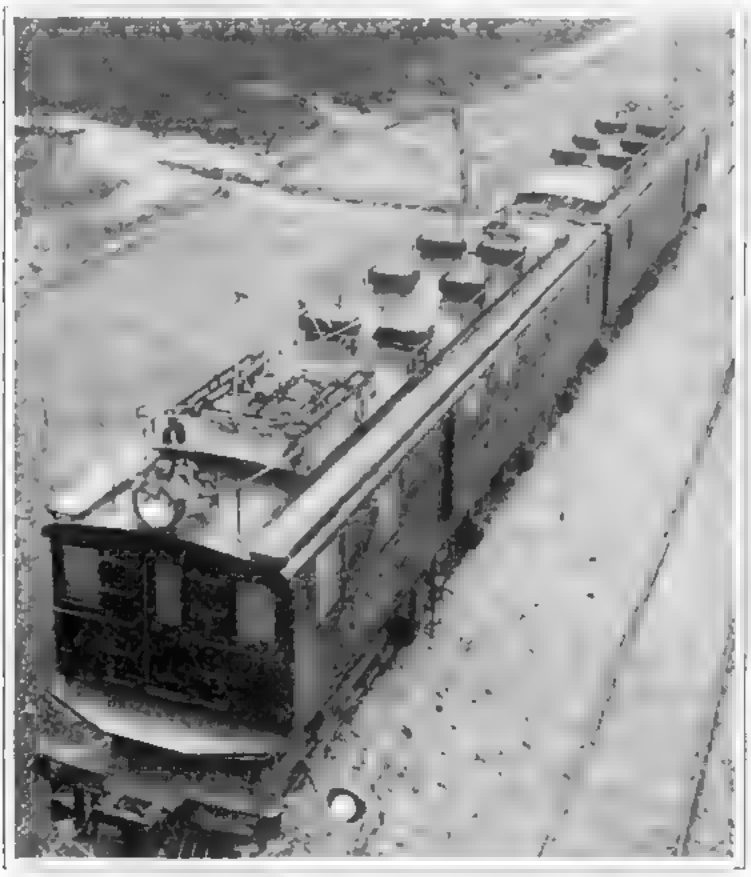
"The problem of the electric locomotive, on the other hand, is to keep cool. It revels in frigid weather. As soon as the

mercury drops below zero the electric locomotive begins to perk up. Its increased efficiency under such conditions offsets other drawbacks due to cold weather.

"Generalizing about average conditions, it may be said that steam will continue to haul trains in level country, while electricity will handle the extra-heavy traffic and do the work in the mountains.

"By locating power-plants beside the coal-mines the railroads will be relieved of the burden of hauling company coal, which now demands so large a part of the tonnage, thus releasing an important part of the facilities for revenue-producing business, besides making an important reduction in expenses.

"The economic limit of electric transmission at present is about two hundred miles; but as there are coal-deposits in every State between New Jersey and the Mississippi River it would be feasible to locate power-houses near the mines at the necessary intervals for the operation of the trunk lines between New York, Chicago and St. Louis



CHICAGO, MILWAUKEE AND ST PAUL ELECTRIC LOCOMOTIVE SEEN FROM ABOVE, SHOWING THE DOUBLE WIRES AND THE PANTOGRAPH WITH DOUBLE TRAYS FOR COLLECTING THE EXTREMELY HIGH VOLTAGE USED HERE THE WIRES ARE GOOD FOR 200 YEARS

Steam Turbines Have Come to the Front.

"Unquestionably the power-plants for the generation of electricity to operate railroads in the East would be steam driven, not alone because of the scarcity of water-power in this region, but also because steam would be cheaper.

"There is a good deal of popular misapprehension about the relative economy of

'white coal.' People seem to forget that it costs money, and sometimes a great deal of money, to develop water-power. Some hydro-electric installations have cost as much as $200 per kilowatt capacity, which figures out at the rate of eight mills per kilowatt hour in interest charges on the investment, which is more than the average enterprise can stand.

"In contrast with this is the extraordinary progress made in the development of the steam turbine. The size of these prime movers has been increased year by year until they have reached 60,000 kilowatts. As the size of the unit has increased the cost of installation and operation has gone down until now it is very low.

"Another point to be considered is the direct influence such a series of large steam electric power-plants distributed across the country would have in developing traffic. Relatively railroads do not require a large amount of power.

"For example, the Milwaukee electrification does not consume more than a quarter of the power produced by the independent company supplying it, the other three-fourths being available for mining and other industries

"But the certainty of so steady and reliable a customer as a railroad is an important inducement for a power company to install a plant and work up a market for the surplus product by inducing industries to locate along the railroad for the double attraction of cheap power and good shipping facilities.

Distributing Radius Is 200 Miles.

"As the radius of distribution for this cheap and otherwise attractive power is about two hundred miles the latitude of choice in locating is ample. Of course, the more industries the more traffic for the railroad, and the greater the prosperity for the region.

"The solution of the food-supply will be facilitated along with the rest, for the farmer has learned to make profitable use of electric power when he can get it at the right price."

To shift from future to present tense, the development of electric railroading has already created a market of some importance for electric locomotives, of which some five hundred are in daily operation, displacing rather more than double that number of steam locomotives.

Taking $60,000 as a fair average price for the lot—although some of the latest types have cost as high as $100,000—we have a total of $30,000,000 worth of electric locomotives. When to the domestic demand is added a growing export trade to Cuba, Chile, France, and elsewhere, it can readily be seen that the electric locomotive-building industry is doing quite nicely, thank you.

Parts Are Built in Three States.

Still, the industry has not yet arrived at the proud distinction of a plant for its own exclusive use. At present the building of an electric locomotive is conducted in three separate plants in as many different States. The steel castings are made at Lynn, Massachusetts; the motors, controllers and other electrical parts are produced at Schenectady, New Lork, while the frame, cab, and other parts are built and the machines assembled and tested at Erie, Pennsylvania.

Compared with the enormous plant at Schenectady, the Erie works are rather small potatoes; for only 3,315 men are employed, of whom twenty per cent are engaged on electric locomotive-building. Like all other up-to-date plants a site has been chosen which affords ample room for expansion, while the portion already built is laid out so that the raw material is delivered by rail as close as possible to the place where the first operation is performed, whence the work moves by progressive stages straight ahead to the other end of the shop from which it emerges complete.

The only variation at Erie is that everything but the cab is made and put together in one building 150 feet wide and 800 feet long, while the cabs are built in a shop 125 by 250 feet beside the lower end of the large structure and taken across by transfer table to the erecting-tracks. Traveling cranes of 60 ton capacity in the larger shop and of 10 and 25 tons in the cab-shop, flit

to and fro with the heavy masses of steel in reckless disregard of the speed limit.

The first, persistent, overwhelming impression of the visitor at the Erie works is stunned amazement at the progress in the art of working in steel there exemplified. So swift and continuous is this progress that a shop superintendent who chanced to linger over his lunch would probably find himself a back number when he did get on the job again.

Here is a double-headed drill-press boring an inch and a half hole through a slab of steel at the rate of a foot an hour. It can bore a hole three inches in diameter.

Takes 'Em Two at a Time.

Indicating the size of the work handled, is a radial drill press with a radius of six feet and a sliding frame with a travel of 30 feet. It does not fritter away time on one slab of steel three inches thick, but takes two at once.

Next is a gang slotter gouging away at both ends at once of six side frames for mining locomotives, each frame being a solid slab of steel four inches thick; that is, twenty-four inches of solid steel at each mouthful and taking two bites at once.

All machine tools travel at high speed, too. Here is a planer dressing a journal-box, with two cutters working at once and tearing off such heavy steel shavings that they have to be fished out of the way with long hooks by two men riding on the table.

The strokes of the planer are so swift that one man would not have time to fish in both pools.

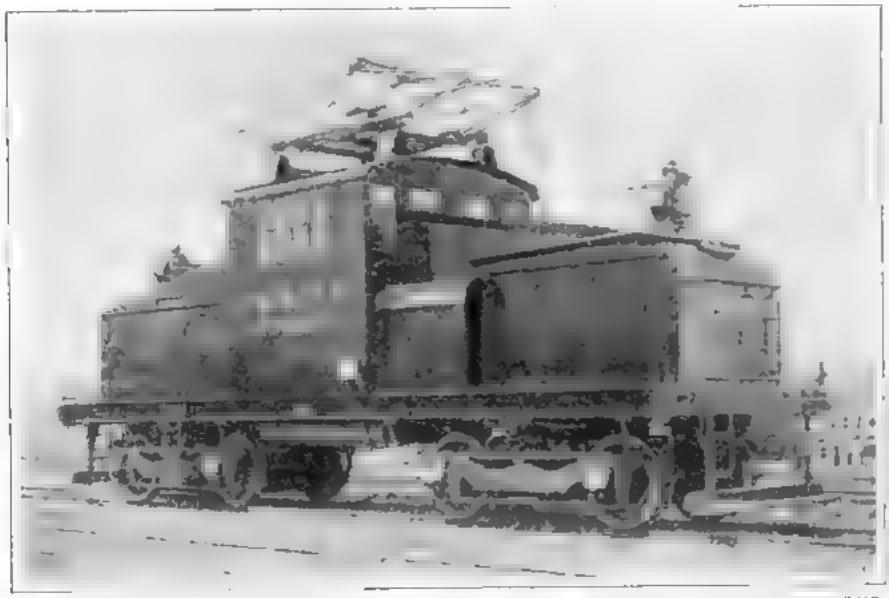
The Versatile Oxy-acetylene Torch.

Even these high-speed machine tools are too slow for this up-to-date shop. Talk about revolutionizing the art of working in steel!

The oxy acetylene torch has knocked the stuffing out of the art and then kicked it downstairs. The extent and variety of the work done with the oxy-acetylene torch and the speed with which it is performed are uncanny.

Why, just look at this stack of steel slabs, like a pile of bridge stringers, five inches thick, that are destined to be frames for an electric locomotive some day. Each has had a rectangular chunk cut out of a corner at each end.

Each chunk of 110 square inches of solid steel was chopped out with an oxy-acetylene



THIS ELECTRIC SWITCHING LOCOMOTIVE IS IDENTICAL WITH THE ROAD LOCOMOTIVES OF THE C., M., & ST P. IN FUNDAMENTALS, BUT YOU CAN SEE HOW GREATLY IT DIFFERS IN EXTERNAL APPEARANCE. NOTE THAT IT HAS THE CLASSIC PIGEON-TAIL THAT ALL GOOD SWITCH ENGINES WEAR, EVEN IF IT HAS NO TANK

torch in twelve minutes. The whole stack was done in four hours. The machine that used to do such work would have doddered over the job two days.

The oxy-acetylene torch will gnaw its way through six inches of solid steel at the rate of three inches a minute; and through a slab eight inches thick at the speed of two inches a minute. The surface it leaves is a little rough, so an eighth of an inch is left to be dressed down by a machine.

The most extraordinary things are done with the oxy-acetylene torch. Here is a man running a pantograph with a torch on the business end, an insignificant bit of apparatus, costing, possibly a thousand dollars, and doing in one hour what a man with a twelve-thousand-dollar machine would have spent four hours in doing yesterday.

A piece of steel that is to be carved with the oxy-acetylene torch is given a coat of calcimine to afford a smooth white surface on which the pattern can be marked with a lead pencil. Then it is placed under the pantograph with which all sorts of cute little curlicues are carved out of heavy steel with as much ease as an amateur scroll-saw artist would work up the lid of a cigar-box.

Men Have Nothing to Do.

If the slab is merely to be sawed in twain, or if any other straight line is to be cut, the operator starts a traveler that carries the torch along the mark, giving a very good imitation of a buzz-saw on the rampage, while the jet of sparks produced answer very nicely for illuminated sawdust.

All the operator has to do is to touch off the gases with the little tin torch that is provided, probably to keep his cigarette going, and turn a cock when the cut is finished.

This amazing process was first suggested by Le Chatelier in 1895 and was first used by Fouche in 1902, although it was left to Jotrand, a Belgian, to produce a practicable apparatus in 1907. The oxy-acetylene process of cutting and welding steel is recognized as one of the most remarkable developments of the twentieth century.

Oxy-acetylene saved many lives by cutting holes in the hull of the steamer Eastland, which capsized at her dock in Chicago while crowded with excursionists a few years ago. No other process would have been quick enough to save lives.

Every wrecking-train—I beg your pardon; no self-respecting railroad harbors a wrecking-train or wreckmaster these days, preferring the more euphonious steam-crane and steam-crane foreman. But anyway they all carry an oxy-acetylene outfit for carving up wreckage—that is to say, locomotives and rolling-stock that have wandered from the straight and narrow path.

Fire departments have oxy-acetylene outfits, too. They are ready for use in fifteen seconds after arriving at a fire or wreck.

The oxy-acetylene torch consists of a brass nozzle fitted with needle valves which fuse jets of oxygen and acetylene gas carried in separate steel cylinders under high pressure into a single jet about as big as a lead-pencil, directed against the metal.

Steel Consumed Like Paper.

If a small piece of iron is heated to redness and dropped into oxygen it will burn rapidly, generating heat the same as any other fuel. This phenomenon explains the action of the oxy-acetylene torch.

In using the torch the acetylene is first turned on and lighted and the needle-valve is further opened until the base of the flame appears to leave the torch and stand away about an eighth of an inch, burning with a large, irregular smoky mass of flame.

A little oxygen is now added, which causes the flame to assume a definite shape and size. As more oxygen is added a white flame appears that blends with a thin, feathery edge into a pale-blue outer flame.

As the oxygen supply still increases the inner white flame becomes smaller and its outline more distinct. When the feathery outline has disappeared the little white inner flame is held about three-sixteenths of an inch from the metal, which almost instantly turns red and then begins to melt, whereupon a still larger supply of oxygen is turned on by means of a thumb lever.

When the full supply of oxygen is in contact with the metal it burns very rapidly, the molten stuff being blown out of the cut in a jet of sparks.

The ease with which steel is consumed may be better understood when it is known that the temperature of the oxy-acetylene flame is 6,300 degree, while the melting-point of steel is only 2,552 degrees Fahrenheit. The little white jet will melt even lime, which fuses at 5,432 degrees, Fahrenheit.

That little pencil of flame wades through steel an inch thick at the rate of a foot in 38 seconds, or two inches thick at the rate of a foot a minute. Masses of steel 36 inches thick have been cut with this same little pencil.

Near the center of the shop is a canvas booth where electric welders fill flaws in steel castings, thus rendering them equal to the perfect product of the founder's art, and join pieces of steel in bonds that no man may put asunder.

The booth is not a manifestation of exclusiveness on the part of the welders, but a protection for the eyes of other workmen. One good look at the greenish-white light of the welding arc is sufficient to cause serious injury to the eyes and has caused total blindness.

With the aid of these inventions, high-speed tools and other refinements it is said that work is done at Erie now for forty per cent less than similar work cost only five years ago. Some progress, eh?

Engines That Look Like Centipeds.

For anything a stranger could see the various metal-working machines in the first half of the shop might be producing anything but electric-locomotive parts, and they probably are, since four-fifths of their output is destined for other uses

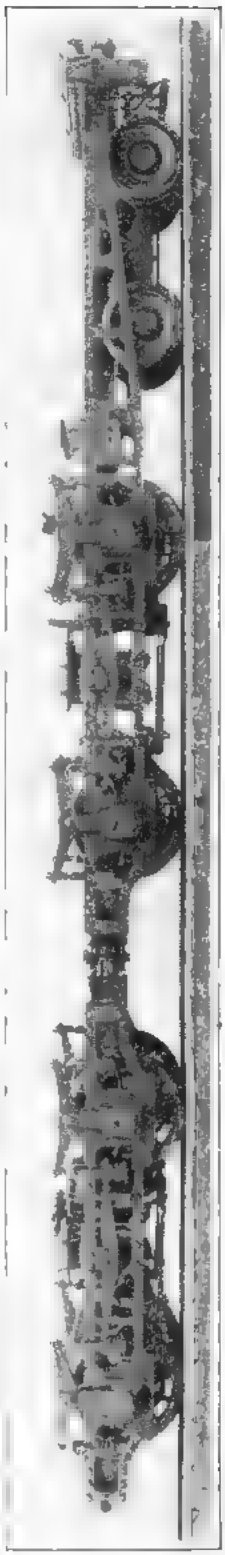
But when you get half way down the stretch of a furlong and a third symptoms of a locomotive begin to appear. Here are two or three men getting paid for assembling a truck, although most of the real work is done by electric cranes and other conveniences. Farther along, over half a dozen erecting-pits, the various stages in the synthesis of an electric locomotive are being exemplified.

The first impression of these growing locomotives is that they come nearer being patterned after a centiped than any other specimen of their kind that has yet appeared; for they have no fewer than 24 wheels, 16 being drivers 52 inches in diameter with cast steel centers having 12 spokes and tires 5½ inches wide and 3 inches thick, while the 8 pressed-steel truck-wheels are 36 inches in diameter.

To continue this personal gossip, the side-frames are carved out of solid slabs of steel 4½ inches thick, 26 inches wide and 30 feet 5 inches long. After all machining has been done they weigh 5,050 pounds.

These side-frames and other parts that take the hauling and bumping stresses are designed to stand 500,000 pounds static pressure with liberal factors of safety. There are four of these airy trifles in each unit of the locomotive, held together by cast-steel transoms and end-pieces.

The complete locomotive, it should be explained, consists of two sections exactly alike, each unit consisting of two four-



THE TWO FOUR-WHEELED DRIVING-TRUCKS AND GUIDING TRUCK THAT GO UNDER ONE UNIT, CONSTITUTING ONE-HALF OF A CHICAGO, MILWAUKEE AND ST PAUL ELECTRIC LOCOMOTIVE EACH OF THOSE DAINTY LITTLE SIDE-FRAMES WEIGH 5,050 POUNDS

wheeled driving-trucks and a guiding-truck. One driving-truck in each unit is symmetrical, the frame of the other being continued in our next out over the guiding-truck, the center pin of which it carries, and ultimately reaching a happy ending in the buffer-beam and pilot.

Each Locomotive Has Two Cabs.

"When these two sections are coupled together there is a guiding-truck at each end, so that no man could tell which way the machine was headed. The problem was solved by building a motorman's cab at each end so that the locomotive can run in either direction without the formality of a visit to the turntable.

The largest geared motors yet mounted on an axle of an electric locomotive are those furnished the Milwaukee type. They drive through yielding gears mounted directly on the axle, one at each end of the motor.

Including spring gears, pinions, gear-case and axle lining complete, each motor weighs 14,860 pounds. Based on the standard rating formulated by the American Institute of Electrical Engineers the motor is capable of developing 452 horse-power for one hour; or 396 horse-power continuous rating based on 100 degrees C. rise of temperature by resistance of the armature and 120 degrees C. by the resistance of the fields.

As there are eight of these motors to a locomotive of the Milwaukee type the nominal capacity of the locomotive is 3,616 horse-power for one hour, or 3,168 horse-power continuous rating. But as they run at comparatively low temperatures in service the locomotive has proved capable of handling heavier trains than was planned.

Steam and Electric Goats are Cousins.

It should be borne in mind that the locomotive here partly described is the Chicago, Milwaukee and St. Paul road type. The same line also has an electric switcher which, while identical with the road type in fundamentals, differs widely in external appearance, the motorman's cab, for one thing, being placed in the center while the apparatus cab is sloped down at each end like the pigeon-tailed tanks affected by steam switch-engines.

And there are as many types of electric locomotives as there are railroads using them. Moreover, the styles change as often as those for women's clothes, although the New York Central's new fall electrics which are designed to whisk eleven steel coaches from Grand Central Terminal to Harmon at any speed up to sixty miles an hour, resemble the styles of 1913.

But to return to our Milwaukees: the construction of the cab in its own private shop is just a plain case of steel-car building as described in a former number of the RAILROAD MAN'S MAGAZINE. When completed it is taken across to the erecting-shop and set down over the locomotive.

The cab is more like a steel car than the conventional cab so familiar on the steam engine, for each unit is completely covered by a steel house 52 feet long and 10 feet wide. Of this space 47 feet is monopolized by the electrical apparatus, while the motorman and fireman have to make out with an apartment not much larger than the parlor of a New York flat.

Fireman on Juice 'Gine? Sure!

Oh, yes! They have a fireman on an electric locomotive. In winter he fires the little boiler that generates steam to heat passenger-cars if it happens to be hauling that kind of a train, only he uses a teaspoon instead of a No. 3 scoop to handle the coal. In summer he can knit socks for soldiers, if he chooses, for it is no fault of his that the weather makes steam heat unnecessary, not to say odious.

But anyway the cab has doors at each side and each end. The motorman's part of the cab is separated by a partition from that containing the apparatus.

With the exception of an aisle twenty-three inches wide on each side the larger end of the cab is crammed with rheostats and contactors through which, in response to the movements of the motorman's controller any desired amount of current can be taken from the wire and put where it will do the most good, switches, lightning arresters, an air-compressor capable of delivering 150 cubic feet of air at 135 pounds

pressure per minute for the air-brakes, signal system and other uses to which compressed air is put on a train, cab-heaters, transformer for the electric headlight and train-lighting system, exciters and a motor driving a large ventilating fan to keep the motors cool.

The motorman's cab is so neat and clean that he can wear his Sunday clothes, if he chooses, without fear of getting them soiled.

How They Control High Voltage.

One of the great difficulties to be overcome in designing the Milwaukee locomotives was to find satisfactory way of collecting and controlling the current at the extraordinary high voltage proposed – 3,000 volts as compared with only 600 used on the New York Central. In fact, it cannot be done; several good friends of the General Electric Company told it so. The usual trolley wheel used on overhead wires would never collect the current while if the pantograph collector proposed was tried it would wear out the wires.

Notwithstanding this friendly tip the company went right ahead and tried the pantograph out and found it had been correctly informed. The friction of the sliding pantograph on the trolley wires will wear them out, it is calculated, in about one hundred years.

The scheme doped out was to use two trolley wires side by side held up by sliding supports to each wire alternately—breaking joints, the section boss would call it. The pantograph, which is a skeleton double diamond, jointed at each corner, bears at the end in contact with the wires two shallow trays about four feet long in each of which a copper strip is placed so that there are always four points of contact between the wires and the collector. Besides, the pan is kept filled with grease to lubricate the wires and reduce friction.

Nothing Is Taken for Granted.

The experiments with the pantograph typify a settled policy of the builders. Nothing is ever taken for granted, but every detail is tested out until there is no possible doubt that it is going to work.

At Schenectady and at Erie there are testing-tracks on which locomotives can be put through their paces, the Erie tracks being three miles long. Some years ago, desiring a practical test of the tractive power of an early type of locomotive, it was coupled on to a steam locomotive, a heavy consolidation, on the testing-track.

The consolidation was started, up, dragging the electric along with it. When the procession was under way the juice was turned on by the motorman on the electric.

Thereupon ensued such a tug-of-war as was never seen before and is not likely to be seen again. The consolidation, being taken by surprise and not wishing to be impolite, hesitated at first; then, finding its courtesy unappreciated, it snorted with indignation, took another notch in the quadrant and a couple on the throttle and set out to teach the upstart electric its place.

But it didn't work. The electric brought the consolidation to a standstill, then walked off with it, the helpless steam engine sputtering and sending up showers of sparks from its stack and from its impotent drivers, clawing unavailingly at the rails.

Regenerative Braking Explained.

Again, it was desired to test the regenerative-braking scheme devised for the Milwaukee, one of the most brilliant of recent advances in electric railroading. This scheme has been described in an earlier issue, but it is not amiss to summarize it here. In going down the long, heavy mountain grades Milwaukee trains on the electric divisions are not held by the air-brake at all. Instead, as soon as the speed of the train exceeds twelve miles an hour the motorman, by moving a lever or so, converts the motors into generators, power to drive which is furnished by the weight of the train pushing the locomotive down the hill

The motors in their capacity as generators reciprocate by offering resistance to the speed of the train—in short, affording perfect speed control. The interesting part of this regenerative-braking scheme is that the railroad company turns this current, generated by its trains going down hill, in at the power-station, which is operated by

IN THE CAB OF AN ELECTRIC LOCOMOTIVE — EVERYTHING HANDY AS A POCKET IN A SHIRT

an independent company and gets credit for it, precisely as a woman returns a dress that she decides she doesn't want to a department-store and gets her money back.

Making a Hill Effect.

But to return to the test: the General Electric has no hill on its testing-tracks, so an electric locomotive was used to represent a train going down a two per cent grade by pushing with about three fourths of its strength against another electric locomotive which played it was taking the imaginary train down the hill.

It worked out just as the engineers had hoped; the current generated by the locomotive holding back flowed into the locomotive that was playing mountain and helping it push. The result of it all was that the engineers found the railroad would net a saving of eight to twelve per cent by the regenerative-braking scheme, not counting the saving in wear on brake-shoes, and ignoring the greatly increased safety and comfort as compared with the air-brake and the increased speed at which trains may be safely operated down heavy grades by using regenerative braking.

When a locomotive has been completed it is taken out on the testing-track and put through its paces for a couple of weeks to eliminate hot-boxes and make sure that everything is in perfect condition. Then, and not until then, it is ready for delivery to the purchaser.

SO NEAT AND NICE THAT THE ARTIST IN CHARGE COULD WEAR HIS SUNDAY CLOTHES IF HE WANTED TO. UPPER PICTURE "GIVING 'ER THE JUICE." LOWER PICTURE, "STOP

The locomotives are shipped on their own wheels; but so valuable a machine cannot be way-billed and left to its own devices like a load of coal. It might develop a hot-box, as the locomotive sent to the San Francisco fair for exhibition actually did, and if there was no one at hand to look after it, it might be ruined or perhaps burn a journal off and ditch the train.

Personally Conducted Tours for Engines.

So a messenger is always despatched with an electric locomotive on its travels. The messenger takes a mattress and an oil-stove into the cab and makes himself at home for the days or weeks that the journey requires.

It is no snap, for the messenger must be up at all hours of the night, as if that ponderous machine weighing 576,000 pounds were a sick baby. Although nothing happens it is the messenger's job to see that nothing does happen.

Like everything else these personally conducted tours for locomotives developed into a specialty. W. B. Valentine has been entrusted with the duty of delivering eighteen locomotives to the Chicago, Milwaukee and St. Paul.

The first Milwaukee locomotive made a regular triumphal progress across the continent, the trip beginning in September, 1915, and last fifty-nine days. Stops of five days at Chicago and three days each at Milwaukee and St. Paul were made. At the latter place thirty thousand visitors gave the machine the once over.

Upon getting on the Milwaukee's own rails word was sent ahead that the electric locomotive was coming and stops of five to ten minutes were made at every station. It was taken all the way to the coast, giving a five days' show at Seattle and seven days at Tacoma.

Then it was brought back to the electrified zone, where it was used for three weeks as a school in which locomotive engineers were converted into motormen and convinced by actual experience that there was no fatal leak of current into the floor or anything else with which they could come in contact.

THE ENGINE.

BY FRANK E. HILL.

GIANT of modern days,
Strong as the lives that made and tumbled thrones,
Out of the smoke and blaze
Where men and blood were mixed with battle-tones
Thou in thy might wert cast from all the toil,
A ruler of the zones.

Strength of a hero's arm?
Deeds of a kind to stir and move the soul?
Vanished? Nay! All the charm
Lurks in the compass of that iron whole
Which leaps the mountain chasm and the flood
To gain a sunlit goal.

THE MOTHER OF SIX R. R. ENGINEERS.

ALTHOUGH SIX OF HER SEVEN SONS RUN LOCOMOTIVES ON FOUR OF THE COUNTRY'S RAILROADS, MRS AMELIA GEISBERG RODE ON THE "STEAM-CARS ONLY ONCE IN HER LIFE

MRS. AMELIA GEISBERG, living twelve miles from St. Joseph, Missouri, has the honor of being the mother of seven sons, six of whom are railway locomotive engineers. Three of them recently have enlisted for service, in the Engineering Corps and are now "somewhere in France."

Besides being the mother of such a galaxy of men, Mrs. Geisberg is noted for the fact that she has ridden on the "steam cars" but once in her life and that was during the summer of 1917, when she came to St. Joseph to see her youngest son leave to join the engineering regiment.

One of her sons runs on the Great Northern, two on the Frisco, two on the Burlington, and one on the Santa Fe in New Mexico. The one running in New Mexico, one from the Burlington and one from the Frisco joined the railroaders' corps and are now seeing service in France

"Do I feel proud of the fact that six of my sons are locomotive engineers?" repeated Mrs. Geisberg in answer to the question. "Well, no; no prouder than I would had the six been farmers or merchants. The one fact of which I am most proud is that a locomotive engineer must be a sober man, and that is what all my boys are. I do not think any one has ever tasted intoxicating liquor in his life

"Once, when my husband was alive, we had a reunion of all the sons, and as they did in Pennsylvania, our old home, years ago, my husband purchased liquors to celebrate the occasion in addition to the dinner we had Although the visitors drank some, not one of my boys touched a drop.

"An engineer has to be a man, and that's what I'm glad of. My seventh boy, who farms the home place, is in the same class"

With her husband Mrs. Geisberg moved from Pennsylvania in 1874, coming through by wagon and steamboat. They settled on a farm in Kansas and afterward moved to their present home, where Mr. Geisberg died in 1893.

The accompanying photo shows Mrs Geisberg as she was ten years ago, and she has changed very little since.

EXIT BOOMER WILLYUM WALKER.

BY CHARLES W. TYLER.

What Chance Does an Honest Smokeboy Stand to Hold Out a Fact on a Questioning Brass Collar?

IF it behooves any of you feeble-minded sons of soil to straggle from the righteous realms of fact (said a boomer of smoky-end fame), linger long and animal cautious before you bray false utterances into the ear of these high-brow investigation chairmen — these research functions concerning the why-for and what-for, who-did and who-didn't, or near catastrophes and otherwise.

Yes, sir, old head, take it from me, if they get you on the carpet, and you feel that you've just *got* to *lie*—well, all I can say is, you have my sympathy. Why, if you were a liar with a pedigree, and had an alibi in every State in the Union and Canada and Ellis Island, they'd call it at every turn. They're weak in the head, those guys—like Solomon.

Sure, I know! Didn't I face the squad with my eyes open? Didn't I go to bat with a skinful of confidence and a skullful of cheese? Yes.

But like Mrs. Casey Jones, Wandering Willie had to get a pie-book on another line. Get me, old-timer?

Just to refrain from getting personal, we'll say this little incident to which I refer occurred somewhere between Sandy Hook and the bottom of West Seventy-Second Street, New York City, in the year of the white potatoes.

It all happened in connection with an extra freight 2862—three hundred tons over tonnage. And as though that wasn't enough grief for any respectable gang of rawhide roasters, why, we come up with a plump assortment out here at a yahoo settlement over the line from Talmadge Hill. I guess we were *due* anyway—take the crew and all.

You see there was Creeping MacKluck, doing chores and opening gates for us up front, at the time, and White-Shirt Witherell pushing reins on the old iron horse—a deluded 2862, with enough wheels under her to have hauled Brooklyn Bridge up the East River, but no tractive inclinations in her dingy old carcass worth a hurrah on Blue Monday.

Riding the old red Tilly-Ann—fifty-six cars back—was General George Atchison, sorting the bills and wearing his heart away chasing over at every stop or time the old pig died to tell us that we'd got to put more pep in the '62 or we'd get canned standing up. Then there was Pansy Mooney, who kept the crummy swept out, and threw off fusees when it looked like we was due to stop somewhere. Pansy didn't believe in wearing out shoe-leather as long as he had plenty of red ammunition.

So much for the crew. They deserve mention; they've worked their way up in the world to where they are by their own efforts—Heaven love 'em—they all ought to be in jail for getting money under false pretenses.

But anyway, we were fourteen hours on duty, when, to be on the safe side of the argument, we put our string of anxiety long coming into the clear thirty minutes ahead of--of—well, we'll call her the Sundown Special. White-Shirt didn't allow he'd take any chances of having to fret the drag over Tillson Summit three or four at a time; so, as I say, we went in and locked the door.

Of course, General Atchison came over

and entered objections of their nature big and wicked, but that was all. We stayed where we were.

I put in a fire and cracked the blower and argued Creeping MacKluck into seeing reason as far as vacating my cushion was concerned, though it was like taking paper off the wall. He saw the force of my argument nevertheless; so went up to horn in at the gateman's shanty at the crossing

White-Shirt and I cocked up our feet on the old bull's jacket and took hold of sleep like a lost soul getting religion on Judgment Day.

Then by and by the special comes jamming along and shivers into the center of our peaceful repose. I have been dormant just long enough to feel warlike and sort of unresponsive when it comes to getting down and stirring around on that old sinner's fighting floor again. So I hang fire and sympathize with myself, and wonder how much steam we've got left.

About this time White-Shirt whispers over that he'd like to know what the Sundown was whistling when she comes pegging through.

"Why?" I says. "What's the matter? Aren't your hear tubes working?"

"Yes, you squarehead!" he says gently, like a sea-cow. "They listen all right when I'm conscious, but I guess I was asleep."

"*Guess!*" I holler. "Why, you old nut, if you went to sleep any sounder you'd be dead!"

"Maybe," he admits caustic, "but *I* am asking *you* what she whistled Or were you in the back shop, too, Eddie Foy?"

"Me?" I grins. "You never knew a smoke to sleep on duty, did you?"

"Huh!" he snorts. "They ought not to; they're all five-eighths paralyzed anyhow!"

But I guess you've got to hand it to the old hoggers at that. They know pretty near as much about what's going on when they're asleep as they do when they're awake. Like me, old White-Shirt Witherell was away gone when the special whales by. Just the same it comes to him as in a dream that she was whistling signals, although he's in no way certain of it.

About this time we see the shack's glim plodding in the direction of the switch up ahead. Creeping Mack shoves her over to red position and bobs us a "come-ahead"; but the pig-eye doesn't respond a little bit.

He is backing a hunch that there is a second section on the way—and he's a sticker for hunches. Most of them are, if you ever noticed.

Well, he fared forth to where the shack is dozing at the switch-stand and puts it up to MacKluck. No; the stinger hadn't heard them whistle either—that is signals. He'd heard the job toot for the crossing, that was all.

"You're a liar by the clock!" says White-Shirt. "You didn't hear 'em whistle anything! You were asleep."

"No, I wasn't either!" says the shack.

"Shut up!" snaps the hog head. "You're asleep yet!"

Here the general appears. As usual, he's full of bad words and brimstone interrogation marks. "Why the great, good grace of Samuel de Horsefat don't we get go? What's the big idea anyhow?

"Why the mystic conflab out here in the middle of the blank-blank track like a squad of flies around a crumb? Why? Who? What? Har-r-r-h?"

"Well, and didn't you hear 'em whistle either, old spavin-foot?" says Witherell.

"Whistle yeh ear!" bawls Mr. Atchison. "They blew for the crossing, that's all"

"Um-m," says the latch-puller. "Maybe—and maybe they *didn't!* I allow you were basking some torpid in your old red wagon yourself. And I know danged well that Pansy Mooney hasn't been all there since he was married"

"Anyhow, what 're you going to do about it?" demands the car boss. "You can't stand here with your mouth open all night, like a dum jasass.'

"We'll stay here till I'm reasonably certain that there's no second section following this here Sundown moocher!" asserts old White-Shirt.

Ten minutes passed.

MacKluck had closed the switch and was sitting on a rail with his feet hanging off. The eagle-eye and the con were in

the hut chinning back and forth and including Bible characters more or less in their conversation, which some is lacking in all the finer elements of that used in the better grade of society.

During a lull in their mouth war, White-Shirt says to me:

"Bill, you go up and ask the old squatter at the crossing what the special whistled."

And I did.

He was a real help, that old fossil.

"Did you hear what the Sundown Special whistled, or did you notice if she was carrying signals?" I asked him.

"Wha'zat? Sundoune Speshall?" says he bright and intelligent, like a hybrid. "Yea-ah, just went a little while ago."

"Sure!" I holler. "I knew that much myself. But was she carrying any signals—green eyes up front? Did she whistle—you know, a long and two shorts? *Signals!* Get it?"

No; he just wagged his head like a rhino taking feed

"Dunno," he says, wiping a crumb of tobacco off his whiskers. "Dunno nawthin' 'bout that, but I seen 'er go by, all right joggin' along right smart, tew."

"You don't say!" I crabs, and beat it back to the hog.

"Get anything?" says Witherell.

"Yes!" I report. "He says she went by. That's all he knows."

"Sure!" blazed the car captain with a snort of disgust. "Might have guessed that, from old Tip Newton. He doesn't savvy anything that isn't in the papers—that hick!"

We stayed in the clear with the gate shut a little over twenty minutes. Then we stay five minutes for luck. But not a thing shows up.

White-Shirt whistles off, and wakes up the shack. MacKluck wrestles over the iron, and we drift down and poke our nose out on to the main.

Ladies and gentlemen, harken!

With a *hoot-t* and a sad, sickening hurrah for-Halifax, sort of entrance, the Sundown Special's second section entered the center of activities at this momentous instant. And you may believe it or not, but there was one high-minded amount of animation forthcoming, almost immediately.

Old White-Shirt Witherell and General George Atchison and Boomer Willyum Walker lent their support moral and otherwise—with absolutely no reserve.

If I remember correctly, the pig-eye and fireman Willyum—possibly because of the athletic propensities of our calling—arrived something like an inch and a quarter clear of the right-of-way fence, practically *en* unit. We beat General Atchison out of the left gangway by a fractional dimension frequently referred to as a "red hair," which is an amazingly trivial margin.

In this instance, it was so slight, in fact, that before the hogger had at all adjusted himself to his new surroundings, the car boss joined us. Or perhaps I should say he attempted to attach himself permanently to Mr. Witherell—feet first, in the soft, spudgy portion of the old-timer's stomach, knocking all the wind out of him for fifteen minutes.

But, anyway, second Mr. Special stopped! Came right up *smack—whoa*—just like that—with the front-end of her Pacific passenger hog sticking clear through a Vermont Valley box, loaded with farming machinery.

Ephraim Voorhees Pratt, trying to get back within ten minutes of the first section, had come whaling along on a double green—probably sailing by the "all blue" signal, just up around the curve, at about the same time that Creeping MacKluck hauled open the switch, automatically putting the semaphore in circuit—but possibly about ten seconds after the second section is by. And there you are.

Outside of White-Shirt getting a dent in his lunch-basket, there were no casualties to speak of. A few passengers sort of got a little surprise as they acknowledged their introduction to emergency air when Ephriam wound her across into the big ditch. But that was all—as far as they were concerned.

Rolling stock, however, met up with a mournful batch of grief—to say nothing of tying up the main line, and so on.

The greatest misfortune was the hogger's, inasmuch as he couldn't get enough

wind into him to cuss good and proper, as the occasion called for. You may believe nevertheless that he made the best of what little breath he *did* manage to get into his lungs.

"Ugh! Ugh! Ugh! W-r-r-f-fuh!" he gasps, trying hard to connect with a couple of short, timely sentences of good old United States railroad brimstone. "I I knew (*pant*) blank-blank well (*pant*) that she whistled some dash-blanked (*pant*) signal (*pant, pant*)! Double-D blank the blanked (*pant*) luck! There'll be (*pant*) nine kinds of blankety-blanked dash to pay (*pant*) now! Uf-f-f-f! Ugh!"

And you know, old head, there was!

Before appearing before the tribunal of investigation, we got together old White Shirt Witherell and Creeping MacKluck and General George Atchison and Pansy Mooney—and swore by all that was great and good to stick by our guns and lie like well, just swear that we were awake at the time, but didn't hear the first section whistle or see any signals. It was the only thing we could see that might let us out.

"Now, *stick!*" was the hogger's last shot. "Stick, you deluded sons of guns! You're all consummate liars anyhow, and you ought to get by. You were wide awake like a Jersey nightingale—you saw the Sundown come whooping through like a streak of—of wet lightning, but yeh *didn't* see the green or hear 'em whistle! Go to it—and may the Lord have mercy on your poor, benighted souls!"

Well, when the time came they called us on to the carpet one at a time. Everything went off like a church picnic.

Old Witherell was first; then MacKluck and the con and the tail-end man went in. After that the hog-head and smoke who had been in the cab of the first section of the Sundown passed the portals and got the third degree.

And after a while the trainmen and the engine crew of the second section of the special heard the call. Slow but sure they put 'em all through the chopper.

Meanwhile Boomer Willyum Walker is sitting with his legs crossed, feeling more satisfied with his lordship every minute.

No; they weren't going to ring me in and ride me at all. Fine; Thank the kind Providence that shinneys for boomers. They realized that we guys were such blooming liars anyhow that it would practically be useless to catch one of the frat with the goods.

Sure, I was going to be let out! Hadn't the gang been put through their paces? Yes. Well, if Willyum was figured a little bit, wouldn't he have got the razzle dazzle with the rest of the 2862's half breeds?

Wasn't it enough to confirm the fact that Mr. Walker was in the clear with his markers showing green? Well, he should worry and get a wrinkle!

They called me next! Isn't that always the way? Har-r-rh?

"H-m! Ahem-m!" says the gent who is conducting the research, eying me like I am a new breed of green worm. "You were the fireman on Extra 2862, I believe?"

"Yes, sir!" I says, fixing my two-cylinder intellect firm on the theme of the sketch, and resolving not to let this big sneeze trip me up anywhere. "I was."

"Yes, yes!" he says, real friendly like a Dutch uncle. "And what is your name, if I may ask?" Just like that!

This line of dope was too deep for me, but I gave it to him just the same; then held my breath for the next chapter of the catechism.

"Now, Willyum," he goes on, "tell me, did you hear the first section of the Sundown Special whistle signals?"

"No, sir!" I says, which was the truest thing I ever laid my tongue to.

"Nor didn't see any green markers on her front-end?" he continued.

Again I asserted with fine, manly enthusiasm that I had *not*—which also was no dream

"Were you awake?" he hollers all of a sudden, getting sort of belligerent in a rush.

"Sure!" I lied, with righteous indignation

Then he shifted back to the soft pedal line of advance—lowering his voice and getting confidential like he was going to promote me to top-cutter sergeant around the works here

"Willyum," he says, speaking like he

was giving friendly advice to brother John's boy, the while his eyes wandered off kind of disinterested to where a map of New England has a black mark straight across, which is the air-line view of the Sundown Special route when it's the crookedest pike a man ever rode over—"Willyum, before the 2862 started to head out, was there any doubt expressed by any of the boys as to whether there might be a second section coming."

"Why, no!" I says.

But away down in the back yard of my feeble mental wood-shed I am beginning to nurse a germ of unrest, somehow.

"Um!" he goes on, thoughtful. "And there were absolutely no doubts in your *own* mind concerning whether the first section *might* have whistled signals or not?"

"Never a conscience-pricking quiver!" I lied, firm as a rock.

He appeared to kind of abide by this statement for a spell; then he repeats sort of meditative:

"Not a doubt, eh?"

"Never a smell!" I says, sticking with the gang like a bright sunbeam in a garret.

Here, it seemed to me, he began to eye me more or less reproachful. So much so that I began to entertain a kind of agitation that all was not exactly well with us—with tallow-pot Willyum. Then, soft and low like a bull moose, he says:

"Well, if you felt so blamed sure what did you go up and ask the crossing tender for? What?"

There you are! Can you beat it?

The testimony as far as Willyum Walker was concerned ended right there. In just thirty-three seconds by the Western Union clock on the wall, I was headed for the M. M.'s office, with a little business undertaking of my own on tap.

At the latter's sanctum, I am entering by the front door at the same moment the guy who has been putting me through the sprouts hustles in by the back.

"Why, hello—Willyum!" he says spotting me.

"Hello yourself!" I says, kind of cold and distant

"What are you after?" he wanted to know.

"Well," I explained, "seeing that it's you, I'll let you in on a secret. I dropped in to present my resignation—full, broad and effective at once!"

"Oh!" And he grinned. "If that's the way you feel about it, Willyum, why, go to it. I just dropped in to see that you were fired!"

I don't know how the other squareheads came out, but the next time you catch Boomer Willyum Walker being made the goat like that, you'll have to go further than a hick gate-tender!

HOW WE ARE DOING "OUR BIT"

BY P. LANSFIELD,

Otisville, Michigan, Section Foreman, Pere Marquette Railroad.

WATCHING out for and repairing breaks and damages in rails or ties—conditions that might plunge a whole trainload of soldiers to destruction or ruin thousands of dollars' worth of war supplies—isn't the only kind of patriotic work at our disposal. By being careful and economical with materials—getting one hundred per cent service out of every spike and bolt and tie—we can save materials that are becoming more and more difficult for the railroads to secure, and thereby avert waste and delay.

There is another bit of conservation work that we trackmen are doing which may also be of interest to the public. We are keeping all right-of way fences in good repair so as to reduce the amount of live stock that is killed by trains

THE RAILROAD THAT FOUND ITSELF.

After Twenty-Six Years Charley, Jimmy, and Pop Arrive to Put a Soul in a Soulless Corporation.

BY TOM SHIRAS.

TWENTY-SIX years without a profit. Irate directors had long since exhausted their eloquence in demanding dividends from inefficient managements that had failed to produce. Years ago stockholders had sighed audibly, with regret, and laid away their profitless certificates with other crisp, lithographed stock certificates that had once held golden hopes, but which had failed to materialize.

The N. & A. M., representing some three hundred and sixty miles of eighty pound steel, and sundry equipment necessary for operation, was on the dinghigh. It was twenty-six years old. For the last fifteen years, extensions had been built every year nearly, with the hope that dividends could be lured from added territory. But the same old deficits showed on the monthly balance sheet. General managers and traffic managers were fired and hired, but the golden ducats hoped for did not put in their appearance.

The Sackcloth of Receivership.

Two or three years ago things were going bad. The railroad commissioners had reduced passenger rates and were fooling with the freight tariffs.

Monthly deficits became larger, and the faces of the stockholders and officers longer and more care-worn. Discouraged, disheartened and beaten, they adopted the reigning habiliment of the railroad world by stepping into the Federal Court and donning a receivership.

A railroad can be no larger than its territory. In all the painful twenty-six years' struggle for profits, no one had seemed to take cognizance of this fact. No one seemed really to realize the significance of its asset —its territory.

Fertile soil on both ends; prairie on the upper, delta on the lower, with mountains in the middle that were rich in mineral resources, virgin timber, with thousands of acres of open range that would support countless head of cattle and other stock.

Pride as a Tonnage-Maker.

A razorback hog and dogy steer country, with a lethargic population. A population with unawakened pride, and better things unthought of.

No one in any one of the numerous organizations ever computed awakened pride as a tonnage-maker. No one ever thought of the farmer boy with a thoroughbred hog as an asset, or a farmer with a thoroughbred bull to head his herd. No one ever figured that cooperation and education would turn the tide.

That was two or three years ago. Now every farmer's boy in the road's territory owns a thoroughbred hog or a herd of them.

He is not the same boy of two or three years ago. There is a bright light in his eyes. He is fired with ambition.

He is no longer just a country yap to be scoffed at by the town boys, or the obsequious member of the family to be bossed and nagged. His breast swells with natural pride. He is starting a thoroughbred herd, and knows more about hogs than his dad ever did.

The dogy steer no longer predominates on the mountain ranges. Every farmer owns a thoroughbred bull, and the dogy is being bred into past history.

Every town on the road, and contingent to the road, from the one-store post-office combined size to the larger cities, has its Progressive Farmers' Club. They are not sport-shirt and tan-shoe clubs, presided over by a highbrow.

"Pop" Stewart, Agricultural Commissioner, organized them and is their guiding force, but for the most part they are run by the citizens in the communities in which they are located, with an occasional lecture by a State expert on some special subject in which they are interested.

Farmer and Live Wire, Both.

Pop is no highbrow. Before he was commissioner he was a brogan and-overall farmer, with the scientific side of his business well in hand. He farmed with his head as well as his hands, and is a wizard on agriculture from planting to marketing.

He has a phraseology full of agricultural philosophy that makes farmers think and awakens dormant pride in their occupation, even the thick-headed, I-know-it-all, or the hookworm-infested kind. He has not only awakened the farmer, but the business and professional men as well, and this gyration of mixed brains has brought results. Dividends!

There are other things as gratifying and quite as noticeable as the dividends, as you will see if you ever have an occasion to take a trip over the N. and A. M. Few damage suits are brought against the road so few as compared with competing roads as to be negligible.

No one has his pile-driver out. The business men don't knock, and the farmers don't graze their stock on the right-of-way in order to sell it high.

You never hear the engineers cursing the master mechanic when his back is turned, nor the train crews the despatchers, agents and operators, nor the traffic men the general passenger and freight-agent. And they all dote on their long legged, angular, youthful faced G. M., whom the receiver swiped off a division superintendent's job on the Illinois Central. He knows every man on the road by name and they all know him. He is not a highbrow or a lowbrow, but a gentleman.

They are all gentlemen, working together to make a success of the business they are running.

The new habiliment of the road, the receiver—"Old Man" the boys call him, but not with disrespect -was wise to the ways of business. That is how he managed to swing the job. He had little knowledge of railroading, but had lots of old bay horse sense.

When the directors turned their burden over to him they felt as though they were shirking a duty, and when they saw him swing their bundle over his shoulder they came smirking to him apologetically for the way they had left things, and tried to make him insensible of the ignominy of the position he had accepted.

But somehow he didn't seem to comprehend. He was such a wiseacre that he believed his appointment had been providential for the welfare of the road, and with a nonchalant air walked jauntily off with his load

But he didn't carry it far. Only to his office. He laid it down on the floor, turned it over with his foot several times, saw that it would be irksome for him, a tenderfoot, to lug around, then sat down in his swivel chair and got his brain in action.

The Receiver Remembers Charley.

Now this receiver was no highbrow. He, too, was a gentleman, and traveled in gentlemen's company.

On a trip back East a year before, on the observation car of an Illinois Central train, he had met a man who was bossing a division. A young chap with long legs, an open face, and constantly alert.

He had a mop of hair which flew back over a forehead that was broad and sloped, not obliquely, or at an acute angle, but in a gentle curve to the top of his head.

As the receiver blew big blue rings from his cigar, he remembered this head, and the chap's pleasing personality.

For convenience we will call this chap Charley. He remembered the results of the inventory he had made of Charley that morning he met him as the train sped along.

It was efficiency.

Too big for his job.

He sighed, leaned over and untied the bundle he had carried to his office. Wrapped up in the freight department he found James.

Henceforth we will not call him James, for James reminds us too much of the proverbial, sedate butler. We are going to call him Jimmy, because he is a bundle of energy, and the name fits his personality.

Had to Travel with Dimmers.

The receiver had Jimmy's record. Jimmy had more ideas about how to get business than a smooth-haired goat has about getting green leaves from tall persimmon sprouts.

Jimmy had never been allowed to go his best. Had always had to travel with dimmers on his lights. A glare coming from a subordinate was dangerous to the former highbrow heads.

The receiver smiled as he wrote down the undignified name, Jimmy, and after it general passenger and freight agent. He dropped back in his swivel chair again, called for his stenographer, and a wire leaped out two ways on the Western Union.

'Way up in Illinois, a young chap that looked like a sophomore at the State university gasped with surprise; and down in Arkansas Jimmy scratched his head doubtingly, wondering whether it meant that he would have to look for another job. Unknown to each other they started next day to the same objective point.

The receiver did not waste words. The conference was short and to the point. It ended in gratifying the ambitions of two men. It injected into them the I'll-do-it-or-bust spirit.

New Bearers of the Burden.

With the receiver the incident was closed until they registered either success or failure. He would act in an advisory capacity, but they must formulate the plan of action and execute it, and they must show dividends within a reasonable time.

They left his office with the burden on a stick between them, and carried it back to the general offices. They looked square at each other across the burden in the G. M.'s office, and in each other's eyes they saw bulldog determination and cooperation.

They put their heads together; and when they parted them, they had the fundamental principles outlined for their future operations. They read like this:

> Make friends! Make every man, woman, and child on the road a friend of the road—not merely an acquaintance. Develop more local tonnage by developing the raw resources. Educate the people to the value of their own country and assist them to make it a better country.
>
> Develop a spirit of cooperation between all departments of the road and between the road and the people. Develop through-freight business by aggressive solicitation. Offer as an inducement service and square dealing.
>
> Treat everybody square and aboveboard. Be economical. Develop system. Capitalize good nature and courtesy.

"Just one thing we left off," commented Jimmy. The G. M. looked up, smiling inquisitively.

"This is all mechanical so far. This road has got to have a soul. It has got to be a warm-blooded thing that can feel. That we will have to breathe into it."

Every Man a Trail-Hitter.

The soul of the road was breathed into it at the first big Get-Together meeting ever held, one night shortly after the burden had been carried home.

That meeting was just like a Billy Sunday meeting. Every man was a trail-hitter. There were no officious highbrows there, and yet the G. M. and Jimmy were there, and all the other minor officials of the road.

Rich, warm, constructive thoughts were disseminated and accepted. Suggestions from section men on economic maintenance of the road-bed. Suggestions from engineers, brakemen, conductors and firemen, that if adopted would make for greater efficiency in the operating department. Suggestions from boilermakers and machinists that would cut down expenses in their departments.

Every man was on his tiptoes, with some real money-saving or money-making idea.

But that was the least important. A bond of friendship, brotherhood and cooperation had been intertwined and riveted to the whole crowd.

The spirit showed on the surface next morning. The stride had quickened in every department.

Jimmy had started in the railroad game sorting way-bills on the Frisco, and he had a record of men stored away in his brain that was marvelous. He drew his freight-solicitors from this record.

"Offer Them Service!"

"Offer them service. The best service, the best men running the best little railroad connecting the North and South can give them. Get the business," he told them.

He stationed them strategically. One in Kansas City. Another in Wichita, in the Kansas wheat-belt. Another in Joplin, center of the Missouri mining-industry. His Southern business-getters were placed at Helena, Little Rock and Chattanooga. He covered both ends admirably.

Then he sent for Pop. He had known him for years, and knew his good points. Pop was a practical, scientific farmer up in Missouri.

Besides knowing the agricultural game from start to finish, he had a personality.

Pop had a smile that worked all the time and spread all over his face. It started 'way down in his heart, and acted on humanity like a burst of sunshine after a spring shower. He was the greatest friend-maker in south Missouri.

This job of agricultural commissioner didn't appeal to Pop much. He didn't like the idea of having a boss.

"Go to it," said Jimmy. "Use your own methods, report to yourself, and if you don't get results, just pay yourself off and quit."

Pop Dreams of a Place in the Sun.

And when Pop took a trip over the road and saw the disarrangement of things, the things that ought to be done that were neglected, and the things being done that were being done wrong, and then drew a mental picture of the country if everything were done right, he started to make a place for himself in the sun.

First he reclassified the territory. To the delta country he gave cotton, rice, alfalfa, as the staples, with feed, food, and fodder as necessary adjuncts. To the mountains he gave stock, fruit, poultry, with feed, food, and fodder as the necessary adjuncts; and to the prairie, stock and small grains with feed, food, and fodder as adjuncts.

You will note that in this classification in each of the different sections his scheme carried with it food for man and beast without buying, with staples adapted to each section, to sell. Before this classification and adoption each section was trying to grow staples not adapted to land and climatic conditions, to a certain extent.

The next move Pop made was to make friends, and to create in these friends a spirit of wanting. Wanting better things.

Pop lived and lives yet with these friends. He has no office. He offices in every town on the road—in the country stores, at the mills on grinding days, on hotel verandas; and on Sunday, maybe, you will find him way out from the road, the guest of some farmer. But always, wherever you find him, you will find him spreading the gospel of better farming and better living.

"Better Farming!" the War-Cry.

The first thing Pop had to combat was distrust. He belonged to the railroad, a corporation.

He allayed this distrust by always referring to the road as a servant of the people, and it was not very long until they began to look upon it much the same as they did their horses and farm implements —something for them to use, for their profit

Then he began to talk better farming, better roads, and better stock, showing the added profit they would bring.

Mind you, he didn't let this out semi-annually at picnics or fairs in a burst of eloquent oratory. He took it right home to the individual, and always he would have something to say about what a grand country it was. No better country on earth!

And after he got acquainted with the old folks he began on the boys, for they would be the farmers of the next genera-

tion and the tonnage would depend on them.

Pop approached the boys as if they amounted to something, treated them with the consideration they deserved; talked to them about thoroughbred hogs, and showed them the difference between a razorback and a Poland China. He got the boys all over the territory talking about and wanting good pigs.

A Chance for the Boys.

One day he strolled into one of the strongest banks in the territory and caught the president in a receptive mood.

"Wouldn't it be a fine thing if we could replace every old razorback in this section with a thoroughbred!" he said, deluging the president with the bright light of one of his most iridescent smiles.

"Fine! Fine!" replied the banker, and followed up his enthusiastic exclamation with an eulogy on the perfect pig. He had been raised a farmer himself.

"Well, then," said Pop, "give every boy in this county a chance to buy one. Loan him the money on a note with the pig as security. It will grow into better security every day it lives."

And the banker did that very thing. He thought a minute first. No chance to lose, a great chance to advertise.

The county papers that week carried the news to the boys. This banker went himself and bought the first carload from the breeders.

The news spread to adjoining counties quicker than Pop could carry it, and every kid along the road now that really wants a good pig either has one or can get it.

With better cattle Pop worked it the same way. He got the breeders to ship this stock in by the car-load and hold public sales.

He would spread the news that a sale would be held at a certain town on a certain day. Those farmers that did not have the cash with which to purchase, he got the banks to finance. He is restocking the country.

And his Progressive Farmers' Clubs, why they jumped at the idea. Better roads, better living, better farming, better stock and better crops. These are the things they are striving for and these are the things they are attaining.

There are eighty some of these clubs actively alert now, with sixteen hundred and ninety members, every member a friend of the road and a booster.

Not only has Pop laid the foundation for a tremendous agricultural tonnage which is beginning to show now, after two years' effort, but he has decreased petty claims and lawsuits to a point that makes the claim agent's job a snap and the attorney's a sinecure.

The real test of the value of his work, however, was applied last year when the road asked for a reduction in taxes and got it without a protest.

The aggressive business-getting organization started out with only one argument—service. Quicker deliveries than competitive lines.

They started to sell something that was hard to deliver—started to sell service in a leaky bucket. Neglected road-bed and neglected power.

But business began to come just the same, and they handled it. That collective bulldog and cooperative spirit that showed in every department on the road, put it over the road.

Each head waited patiently for his meager appropriation, and when he got it he got one hundred cents' worth of value out of every dollar he spent.

A railroad is only as strong as its weakest point. The G. M. fought these weak points twenty-four hours a day. After twelve months he won the battle. Redball freights and passenger trains began to run at maximum speed.

G. M. Goes to Department Heads.

He did not win this fight with stereotyped bulletins setting at his desk. The heads of departments did not come to him; he went to them. And besides his timely advice he carried into every department self-confidence, optimism, cheerfulness, characteristics that dominated his personality.

Every month he presided over two meetings—one, a big get-together meeting, that

always sent the mercury in the efficiency thermometer up several degrees; the other a safety-first meeting which rapidly diminished the number of accidents.

Jimmy, the G. P. and F. A., was the big game-hunter of the organization. He covered more territory than the other two put together, for his hunting-grounds were outside the local scope

For weeks and weeks all Mrs. Jimmy saw of him was when she met him at the depot with a kiss, a hello and good-by as he blew through on number one or number two. Jimmy was busy bagging tonnage-makers.

A big farmer up North would write making inquiry about lands — thinking of changing his location. A mine operator out West or up North wants reports on mineral deposits along the line. Cattle man up in Nebraska writes asking about the mountain ranges. Big contractor with a big revetment contract on the lower Mississippi wants to know about stone.

No Pigeon-Hole and Form-Letter Stuff.

Jimmy does not reach up in a pigeon-hole in his desk and drag down a form letter giving the particular information he wants. No such thing as a form letter in his office! He shoots him a warm-blooded, got-just-what-you-want letter, swings on number one or number two, and follows that missive right to the prospect.

He knows the resources of his territory by heart—knows every fertile valley; every mountain range; every mineralized zone.

And back of that knowledge is confidence—confidence that people who know these different industries can make good when they come. And this knowledge of good things stored up in the territory, and the fact that he himself believes heart and soul in them and in his road, and his inspiring eloquence in the description of the opportunities only awaiting mental and muscular effort to turn them into money, generally make believers out of them.

Jimmy doesn't stop when he gets them, either. Like Pop he stays right by them loyally. Ask 'em.

As the war dragged on, cotton began to soar; and as the price came up, cars got scarce. They were using them at Eastern seaboard points for storage purposes—paying demurrage on them, and the South crying for them.

Jimmy saw the cars disappear off the road with increasing apprehension. Cotton bales grew higher and higher on the platforms.

The commodity is shipped bill of lading, sight draft attached. No money until it was billed. It looked as if the market was getting top heavy.

Protecting the Cotton-Planters.

A wail went up. An appeal to Jimmy for help. No box cars. Not enough to make a small dent in it.

But Jimmy dared. He hooked forty-two flats onto two locomotives and went himself, and for two solid weeks they worked night and day getting the cotton to the compresses

A risk? Yes. A stray spark unnoticed might have meant a blazing comet any number of times instead of a cotton train; but Jimmy watched the sparks. That was one of the reasons he went along

Ten days after the last trainload was moved cotton slumped a clean twenty-five dollars a bale. But Jimmy's people didn't take the loss. It was the other fellow, and that much was saved as a cash asset for the cotton raisers in the territory.

Jimmy is a strong advocate of safety first. He has pyramided and developed the idea, so as to make it applicable to every department of the road.

Safety First Applied to Traffic-Getting.

"You see," he said the other day, "there are other accidents that can happen to us besides wrecks, and the killing and injuring of passengers and employees. It is dangerous for a freight solicitor to make a false promise.

"Truth is safety first in our traffic department because it makes and holds our business. In our general offices safety first is the watchword. A mistake in making up a balance sheet or in making an entry in any one of our numerous ledgers causes no end of extra work and annoyance.

"Every morning when I stick my head

in the office door I chirp, 'Safety First!' You would be surprised to know the effect the thoroughness and efficiency it has developed.

"I have also capitalized the smile. A smile and a pleasant reply is an asset, a frown and a sharp reply a liability. The rather uncouth person who buys a ticket from one tank town to another may be our biggest shipper next year, or he may be a big shipper now.

"We do not follow the Paris modes or the Broadway styles down here, and affluence and wealth cannot always be reckoned from the kind of clothes a person wears. Besides, it's the right way anyway. No one loves a grouch."

They're All of 'Em Congenial.

To see just how deep Jimmy's idea was sinking into his working force, two days later I asked a depot agent at a small town what time the train would be there. I asked him five times in forty minutes. It was plainly chalked up on the bulletin-board on the outside of the depot.

"Five times that congenial, tow-headed chap grinned, chirped back at me, 'Four eighteen,' and never once referred me to the board.

I have never met the receiver of this rather remarkable little road, and am not acquainted with his characteristics, but he must be a man of supreme intelligence, with a profound confidence in his lieutenants. And the men, all of them, from the G. M. down to the section hands, feel that in him they have at the head a man who represents justice and appreciates their efforts.

The results of this constructive work with the underlying principles by which it was guided, and which were strongly adhered to, are not surprising. For eighteen months the balance-sheet at the end of each month showed a gain.

The nineteenth month showed a profit, and the five succeeding months a gain each one over the other.

And yet the G. M., Pop, and Jimmy do not seem to think they have done anything extraordinary. They cling fast to their ideals of railroading. These they have only partly realized.

Oh, Happy Land!

They dream of a day when every acre in the territory suitable for cultivation will be making its maximum production, when every mountain range and pasture will be grazing its quota of thoroughbred stock, when every mineral outcrop will have its producing mine, and every commercial ledge of stone its quarry.

They hope to hold the friendship of their territory. They hope to make a big success, for a big success is sweet, not alone on account of the financial emoluments it will bring them, but because it is their work and they love it.

THE RAILROADS ARE NOT:

Sending delegations to Washington to have training camps established in some particular neighborhood.

Quibbling over type of ships to be built.

Requesting routing of freight through some obscure port lacking in facilities.

Reading disloyal foreign language publications.

Neglecting to salute the colors and the national anthem.

Blocking needed legislation.

Numbered among the "copperheads."

Employing an unnecessary number of potential soldiers except as forced to do so by State laws.

Eating lamb.

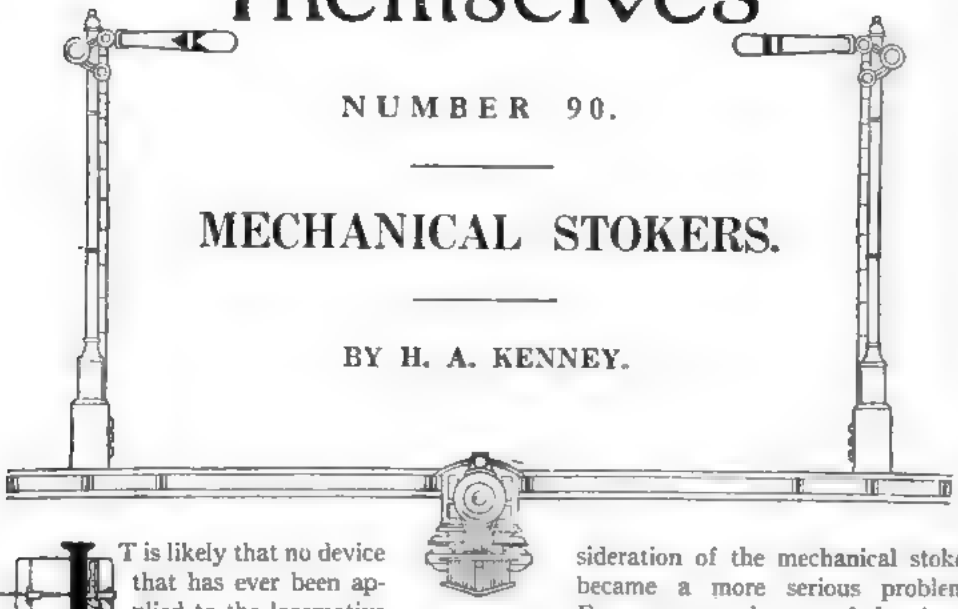
—*The Railway Review.*

Help for Men Who Help Themselves

NUMBER 90.

MECHANICAL STOKERS.

BY H. A. KENNEY.



IT is likely that no device that has ever been applied to the locomotive has made such rapid strides into popular favor as the mechanical stoker. While it was first introduced about a quarter of a century ago, and its success in stationary engine practise was early assured, it is only in more recent years that its adaptation to locomotive service received the support necessary for its ultimate success.

There is no question but that it was at first opposed by the locomotive firemen and others, due to the fact that the impression was prevalent that the introduction of such devices meant the employment of unskilled labor for the operation of the stokers, thus affecting the security of the position and pay of firemen.

Skilled Men Still Required.

The development of the mechanical stokers now in use dispelled these illusions, for it requires a skilled man to operate them.

As the cost of railroad operation, due to government regulation and the increased cost of labor and materials mounted, consideration of the mechanical stoker became a more serious problem. Economy was the cry of the times. Freight being the most lucrative source of revenue of the road, the burning question was how the cost of the ton mile was to be reduced.

More tonnage per train, or the same tonnage in less time, was the only solution, and this meant larger cars, longer trains, and increased power. The steam locomotive, which in the last analysis is the chief revenue earner of every railroad, was developed to meet the growing demands, until the limit as to size was reached, or the physical capacity and endurance of a fireman was surpassed.

There was an imperative demand for two firemen on the larger engines, but this is impractical aside from the increased cost. It has been truly said that "necessity is the mother of invention," and the locomotive stoker drew the attention of a number of eminent engineers, with the result that to-day there are in successful operation at least five different locomotive stokers: the Street, the Duplex, the Hanna, and the Standard—all of which are of the scatter

or overfeed type—and the Crawford, of the underfeed type

Clement F. Street, Pioneer.

One of the pioneers in the locomotive-stoker problem was Clement F. Street, who placed his first stoker on a locomotive in 1909; and while he was not the first to design a stoker that would deliver coal to the fire-box, he was certainly the first to demonstrate a stoker that would deliver the fuel at a rate and in sufficient quantity and regulation to maintain satisfactory steam pressure.

The Street stoker has by far a wider application than any other, there being approximately 3,500 of them in service

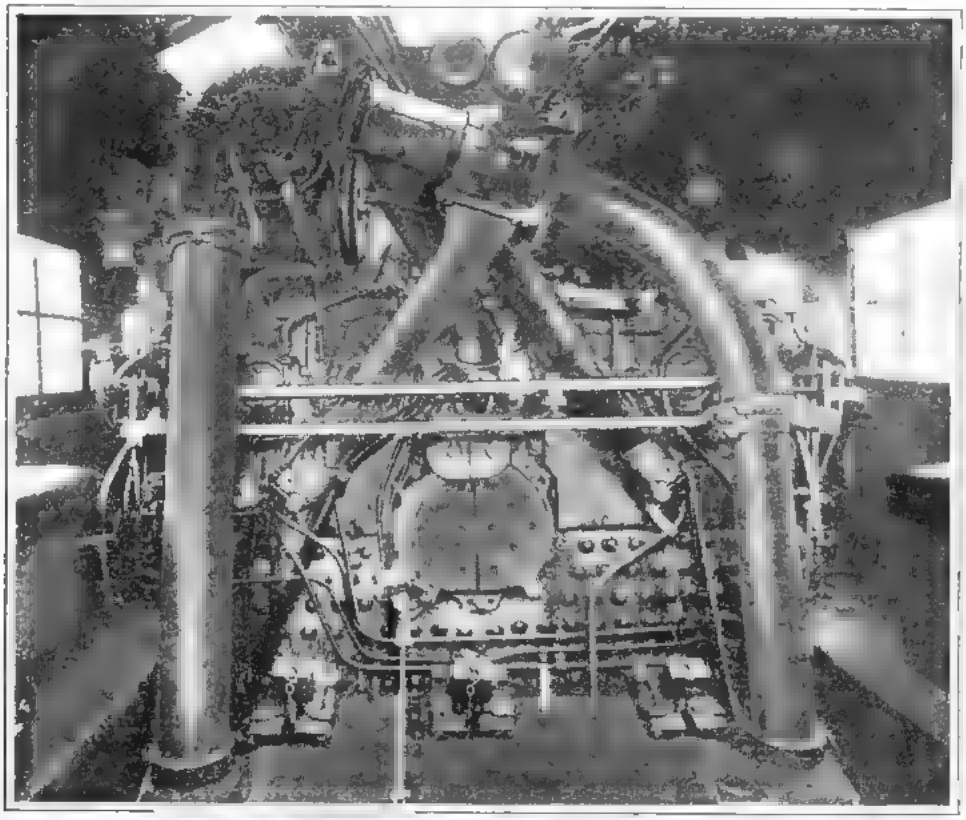
The machine is of the overfeed or scatter type, and, as shown in our illustrations, consists of a screw conveyor for moving prepared coal from the tender to the locomotive, an elevator for raising the coal to a point above the fire-door, a regulation system for delivering the coal to the fire box, and an adjustable distributing-system for spreading the coal over the grate

The Street machine is designed to take screened coal on the tank, below the coal-space of which a screen is provided through which the coal must pass before entering the stoker proper

This screen is carried in sliding supports, and has a reciprocal motion of about six inches, which facilitates the passage of the coal through the openings to a trough where it is conveyed by means of a helicoid screw to the elevator hopper located below the deck of the locomotive.

Endless Bucket Chain Elevates Coal.

Here an endless chain of buckets driven by a small engine elevates the coal to a discharge pipe or distributing-center located in the elevator casing above the fire-



CLEMENT F. STREET, DESIGNER OF THE STOKER WHICH BEARS HIS NAME, WAS THE FIRST MAN TO DEMONSTRATE A STOKER THAT WOULD DELIVER FUEL AT A RATE AND IN SUFFICIENT QUANTITY TO MAINTAIN SATISFACTORY STEAM PRESSURE. IT IS SHOWN HERE APPLIED TO A LOCOMOTIVE

door, and in this is embodied mechanism for dividing the coal between three distributors.

In one end of the discharge-pipe a circular screen of sheet metal is provided with openings of four different sizes. The coal after entering the discharge pipe is passed over this screen by the elevator.

The fine coal falling through the screen into the center distributor pipe is deposited in an elbow fitted to the backhead of the fire-box directly above the fire-door. The coarser particles pass over the screen and are divided between the right and left-hand distributor pipes and deposited in elbows fitted to the right and left hand sides of the backhead on each side of the fire-door.

Steam-jets blow the coal from the elbows through tubes fitted with distributors that spread the coal over the entire surface of the fire.

Engine Must Be Working Steam First.

In firing with a mechanical stoker the practise is to build up a good fire by hand and get up full steam-pressure before leaving the terminal, the stoker not being brought into use until the engine is working steam.

The elevator engine is then brought into use by the fireman. This engine is of variable speed, being controlled by a lever and quadrant provided with seven notches so that the machine can be set at any one of seven speeds.

It will thus be seen that the fireman can increase or decrease the amount of coal being fed as the conditions require. A friction-clutch of the disk type is provided between the elevator and the stoker mechanism by means of which the fireman can instantly start or stop the coal delivery to the distributors.

There is also a clever device for controlling the steam-jets that affects the distance that the coal is thrown into the fire-box. This cam motion is mounted on the end of a sprocket-wheel shaft.

The controller cam-head has four projections which can be thrown in or out by the fireman. When thrown out they come in contact with the controller-lever, and open the controller-valve intermittently, admitting steam to the distributors. There are projections of eight different sizes which give the fireman an option of using steam-jets of eight graduations of time, and having one, two, three, or four jets per revolution of the cam-head, which revolves at a constant speed of thirty revolutions per minute.

The distance the coal is projected into the fire-box is governed by the number and duration of the steam-jets.

A jet of long duration will throw the coal farther than a short one. If coal is wanted at the back end of the fire-box, a small number of jets of short duration are used, and if needed at the front end jets of long duration and several in number are used.

The number of valves, levers, handles, and slides is an indication that the operation of the mechanical stoker is beyond the sphere of what is known as unskilled labor.

As a matter of fact, to operate with any kind of efficiency the mechanical stoker requires the attention of a skilled fireman, familiar with the process of combustion and steam generation. While it will at first seem that such an appliance is complex, in reality it is as simple to understand and operate as the gage-cocks, blower-valves, and other boiler-mountings.

Duplex Can Crush Lump Coal.

The Duplex stoker is the production of the Locomotive Stoker Company, the manufacturers of the Street stoker.

This design represents a development to meet the demand from some districts of the country for a stoker that would successfully crush lump coal, or handle other than what is known as stoker coal, that is, a mixture of nut, pea, and slack, where this class of coal is expensive or impossible to secure.

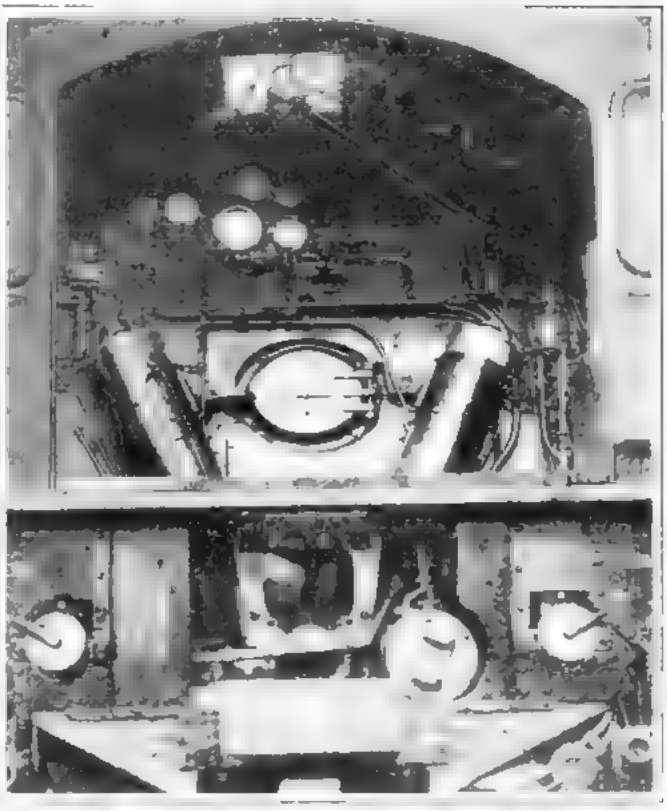
Also the Duplex aims to overcome objections to the noise of the intermittent steam-jet, and obstructions in the cab.

As will be noted in the illustration the Duplex stoker takes up very little cab space, having only two elevator casings extending a short distance above the deck on either side of the fire-door.

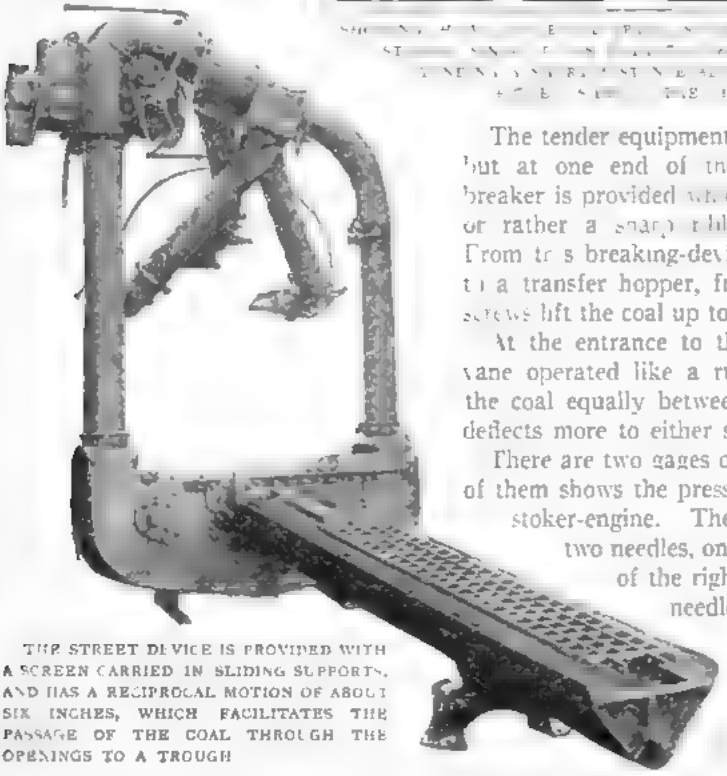
The flexibility of control to which the widespread use and general high efficiency of the Street stoker was due, is retained and the stoker handles lump coal and wet or dry slack.

The intermittent steam-jet for distribution of the coal from the distributors, and which was one of the objectionable features of the Street stoker, is dispensed with, and instead a constant low-pressure steam-jet is used to distribute the coal over the entire fire-box

The operation of the Duplex is simplicity itself, and the production of this design probably represents the most substantial advance in the art of mechanical firing to date.



THE DUPLEX



THE STREET DEVICE IS PROVIDED WITH A SCREEN CARRIED IN SLIDING SUPPORTS, AND HAS A RECIPROCAL MOTION OF ABOUT SIX INCHES, WHICH FACILITATES THE PASSAGE OF THE COAL THROUGH THE OPENINGS TO A TROUGH

The tender equipment is similar to the Street, but at one end of the trough a crusher or breaker is provided which consists of a notched or rather a sharp ribbed piece of cast steel From this breaking-device the coal is delivered to a transfer hopper, from which two elevator screws lift the coal up to the distributing-elbows.

At the entrance to the transfer hopper is a vane operated like a rudder which distributes the coal equally between the two elevators, or deflects more to either side as desired

There are two gages on the boiler-head. One of them shows the pressure of the steam to the stoker-engine. The second picture shows two needles, one indicating the pressure of the right steam-jet. The other needle indicates the pressure of the other jet for blowing the coal into the fire-box.

The whole mechanism with its various

adjustments, all in the hands of the fireman, deals with any and all contingencies which may arise and permits of a very close degree of manipulation of the machine by the fireman, so as fully to cope with the work of the engine, be it heavy or light.

The Hanna stoker made rapid strides into favor recently, several hundred of them being distributed over the Norfolk and Western, the Chesapeake and Ohio, the Erie, the Southern, and other roads that were early experimenters with mechanical stokers. It seems to be giving very satisfactory service.

Hanna Type Conveys Coal by Worm.

The operation of the Hanna stoker may briefly be stated by saying that coal falls by the action of gravity into a conveyor combined with a crusher, which is situated in the water-bottom of the tank; from that point it is pushed onward through a flexible pipe into a locomotive hopper under the deck.

Coal is delivered by a worm conveyor to the base of a vertical worm, by which it is carried upward and forced through a curved pipe to a point above the door, as shown in our illustration. From here it drops down and passes over a ridge-plate, to which are pivoted wings.

These wings move alternately up and down, constantly changing the angle at which the coal passes over the distributing-plate. This is done by continuous steam-blasts, which are driven out over the distributing-plate from a series of radially directed nozzles operating in connection with a fanlike sheet-blast emanating from a lower chamber.

Blasts Lay Fuel Smoothly.

These blasts in connection with back corner channels cut in the face of the distributing-plate cover the entire grate-surface with an even layer of coal.

The stoker is worked by a simple two-cylinder, double-acting, reversible engine attached to the left side of the locomotive frame under the fireman's running-board and controlled by a throttle on the left side of the cab. Connection between the engine and stoker is made by means of a chain-drive to the vertical worm jack-shaft, and from this shaft to the locomotive hopper worm-shaft, the other end of which engages through miter-gears with the tender crusher drive.

Independent Operation Secured.

This drive is thrown in and out by a jaw-clutch with a lever on the deck, so that the device on the engine can be operated independently of the tender equipment. Connection with the tender apparatus is made by a universal slip-shaft, which allows for different movements of engine and tender.

Concerning the wings to which we have made reference above, it may be said that the wing-control handles are set so the wings will travel slowly and continuously up and down the sides of the ridge-plate, successively changing the point to which the coal is to be thrown.

If need be the wings can be stopped at the top so as to make a channel down the center of the fire-box; or the wings can be stopped at the bottom making a channel into each back corner; or one wing can be brought to rest at the top and the other at the bottom, and all the coal thrown to one back corner, or *vice versa*.

Other points of delivery can be selected and coal fed to them as desired.

Standard Mechanism Is below Engine Deck.

Like the three previously referred to, the Standard stoker is also of the overfeed type. Only about thirty of them are as yet in service and we will not at this time describe them in detail.

In this design adequate crushing facilities are provided on the tender. The entire mechanism is located below the deck of the engine, leaving the engineer and fireman as free as before its installation.

This seems to be one of its special claims, but it also is provided with good distributing features, and is simple in control.

It is in service on the Norfolk and Western, the New York Central and several other roads and is giving satisfactory service.

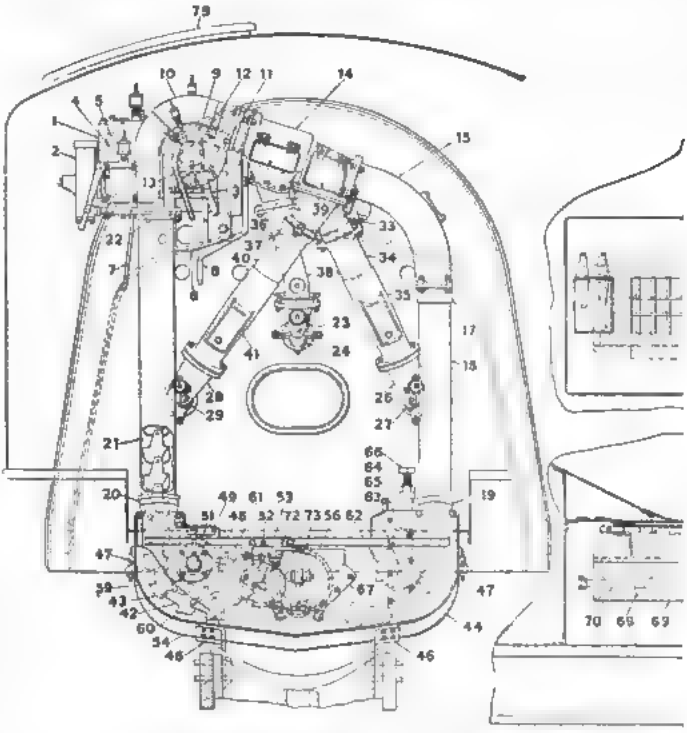
The Crawford stoker is really the only underfeed stoker in successful operation,

several hundred of them being in service, principally on the Pennsylvania Lines west of Pittsburgh. With this stoker the coal is conveyed from the tender by means of a feeder and breaker sliding backward and forward below the center line of the tender.

Inside the conveyor are rake fingers operated from a bar above and extending nearly to the bottom of the trough, and having such a movement as to drag over the coal in moving backward and scraping the coal toward the locomotive in its forward movement.

From the conveyor the coal is led to a point beneath the deck plate, where it is pushed by plungers into two longitudinal troughs below the surface of the fire box grates. In these troughs plungers or feeders are provided for conveying the coal to the middle or forward portions of the grate.

The arrangement of these feeders is such that their number can be increased or decreased to get the desired distribution of coal. The entire mechanism is operated by a single-cylinder engine, controlled by a small valve in the cab.



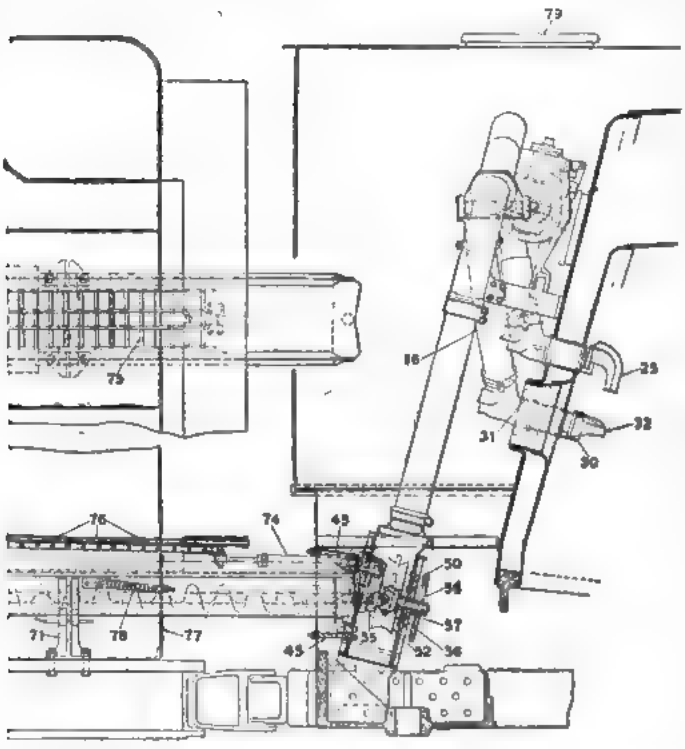
DETAILED DRAWING OF A STREET MECHANICAL STOKER

1, Elevator Engine, 2, Main Bearing and Oil Separator; 3, Elevator Engine Fly-wheel; 4, Elevator Engine Exhaust Pipe, 5, Elevator Engine Steam Pipe; 6, Elevator Engine Bracket; 7, Friction Clutch Handle; 8, Friction Clutch Secondary Handle, 9, Sprocket Wheel Casing and Friction Clutch; 10, Sprocket Wheel Casing Cover; 11 Controller Valve; 12, Controller Cam; 13, Controller Lever; 14, Discharge Pipe; 15, Pipe Bend; 16, Pipe Bend 17, 6-inch Elevator Pipe Flange; 18, 6-inch Elevator Pipe; 19, 6-inch Bell Mouth; 20, 7-inch Bell Mouth; 21, 7-inch Elevator Pipe; 22, 7-inch Elevator Pipe Flange; 23, Center Distributor Elbow; 24, Center Distributor Elbow Bottom; 25, Center Distributor; 26, Right Distributor Elbow; 27, Right Distributor Elbow Bottom; 28, Left Distributor Elbow; 29, Left Distributor Elbow Bottom; 30, Left and Right Distributor Tubes; 31, Distributor Elbow Coupling Pins, 32, Left and Right Distributors; 33, Right Discharge Distributor; 34, Upper Distributor Pipe, Right; 35, Lower Distributor Pipe, Right; 36, Center Discharge Distributor; 37, Upper Distributor Pipe, Center; 38, Lower Distributor Pipe, Center; 39, Left Discharge Distributor; 40, Upper Distributor Pipe, Left; 41, Lower Distributor Pipe, Left; 42, Ele-

Benefits to Fireman and Company.

In closing, it might be stated that such powerful locomotive equipment as the Triplex articulated engines of the Virginian and Erie roads, and the heavy Mallets, as well as the now popular Santa Fe or 2-10-2 type engines for heavy freight, could never have been thought of before the introduction of successful appliances for mechanically feeding them with fuel.

The general all-around advantages of the mechanical stoker were summed up by one manufacturer, and the same may be said of any of the successful devices in operation. By their use the railroad company receives: (1) increased tonnage per train; (2) maximum steam pressure at all times; (3) full working capacity of locomotives; (4) increased average speed of heavy freight-



BELOW ARE GIVEN THE NAMES OF ALL THE PARTS.

vator Buckets; 43, Elevator Bucket Coupling Pin; 44, Elevator Hopper; 45, Elevator Hopper Cab Bracket Braces; 46, Elevator Hopper Frame Braces, Right and Left; 47, Elevator Hopper Door Catch; 48, Conveyor Driving Sprocket; 49, Elevator Hopper Main Shaft; 50, Elevator Hopper Main Shaft Bearing, Front; 51, Elevator Hopper Main Shaft Bearing, Back; 52, Elevator Bucket Chain Idler; 53, Elevator Bucket Chain Idler Shaft; 54, Elevator Bucket Chain Idler Shaft Bearing; 55, Elevator Bucket Chain Idler Shaft Collar, 56, Universal Joint, 57, Universal Joint Shaft Bearing; 58, Screw Driving Sprocket; 59, Chain Driving Sprocket; 60, Screw Driving Chain; 61, Screw Driving Chain Idler; 62, Adjustable Sprocket Idler; 63, Adjustable Sprocket Idler Shaft; 64, Bearing Yoke Guide; 65, Bearing Yoke; 66, Adjusting Screw; 67, Conveyor Trough Bracket; 68, Conveyor Screw; 69, Conveyor Trough; 70, Conveyor Screw Shaft; 71, Conveyor Trough Slide Support; 72, Bell Crank Bracket; 73, Screen Shaker Bell Crank; 74, Screen Shaker Rod; 75, Tender Screen; 76, Slide Plates; 77, Wind-shield; 78, Wind-shield Spring; 79, Ventilator, to allow Elevator Engine to be lifted through Cab Roof.

trains; (5) increased flexibility of train movement; (6) reduced liability of locomotive failures; (7) reduced overtime of train-crews; (8) increased safety with two men watching signals; (9) reduced time required for cleaning fires; (10) reduced cost of locomotive repairs.

The fireman receives: (1) elimination of physical labor; (2) high-grade work; (3) more regular work, since he can follow his engine every day; (4) better pay due to regular work; (5) better training for becoming an engineer; (6) pay for his brains instead of his brawn; (7) better hours and more time at home; (8) long life due to easier working conditions; (9) increased safety with two men watching signals; (10) cleaner work due to elimination of objectionable smoke.

In view of the national crisis, and the congestion of freight traffic due therefrom, the two important features made possible with the advent of the locomotive stoker are increased tonnage and the increased average speed of heavy freight-trains.

There are many places in the country where very heavy locomotives are operating at speeds as low as six, seven, or eight miles per hour by hand firing, but when a speed of ten or twenty miles an hour is approached by these machines, no man living can fire them. With the automatic stoker, however, the average speed may be increased.

Tests on one of the Western roads has shown that a stoker-fired Santa Fe type engine hauled 1,483 tons more than a Mikado type engine of 60,000 pounds tractive effort.

Tests have also shown that the cost of coal per ten thousand ton miles of a stoker-fired Santa Fe type engine was thirty-four cents as compared with forty-five cents for a hand-fired Mikado. This decrease in the fuel bill per thousand ton miles put over the road is also an item worthy of serious consideration by railroad officials in view of the present situation.

BRIDGES TRADED IN RECORD TIME—

PERMANENT MASONRY PIERS CLEAR OF BOTH BRIDGES ON THE UNION PACIFIC LINE WHICH WERE MOVED IN RECORD TIME. THE OLD STRUCTURE HAS BEEN MOVED TO THE LEFT, AND THE NEW BRIDGE IS RESTING ON FALSE WORK UPON WHICH IT WAS CONSTRUCTED

WHEN the double-track steel bridge was constructed between Omaha and Council Bluffs in 1887 its builders no doubt believed that it would never have to be replaced by a more substantial structure, for it was a notable achievement in bridge-building.

These engineers would have been surprised at the amazing feat of their successors, who jacked up that two-and-a-half-million-pound trussed steel, set it on rollers and moved the four spans off the piers and a new bridge into its place in the short time of five hours.

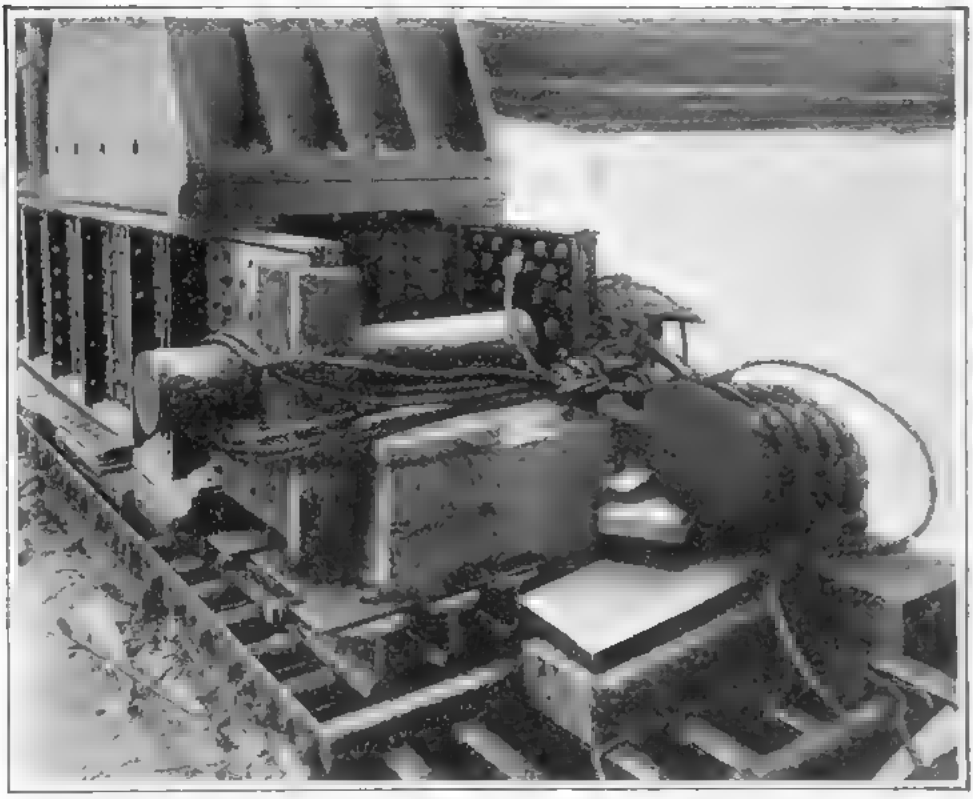
The old piers were allowed to stand, but on each side of them a heavy false work of timbers was erected, that on the up-stream side being in readiness to receive the old bridge, while that on the down-stream side supported the new bridge which was constructed beside it. The new bridge was built with the arrangements for rolling it into place, but special devices had to be made in order to lift the old bridge by five-hundred-ton hydraulic jacks.

The steel rollers on which the bridges were shifted ran upon ten rails to each span, and between the rollers and the girders were ten more rails, set with the heads down; thus the rollers operated with little friction between two sets of rails.

Five hoist engines were used for shifting the bridges. They were set up on the new spans, one at each pier, solidly blocked up and supplied with tackles and two-inch cables.

Careful arrangements were made for simultaneous action of the engines. A chief signalman in the center of the bridge struck a gong and at the sound, each of the signal

—U. P.'S GREAT ENGINEERING TRICK.



A CLOSE-UP VIEW OF THE TACKLE, SHOWING THE SOLID STEEL ROLLERS AND BOTH UPPER AND LOWER BEARINGS BETWEEN WHICH THE ROLLERS OPERATED. THERE WERE FOUR SPANS MAKING A TOTAL LENGTH OF 1,000 FEET, WEIGHING 3 850 TONS. MOVED IN 5 HOURS

men before the five hoist engines raised his red flag and the movement began. The old bridge was first hauled to its new position on the false work, and then the new structure was moved into its permanent position

As stated, the operation lasted only five hours, which includes the entire time that the bridge was closed to traffic, and this time would have been shortened but for engine trouble on two of the hoists. It was a matter of utmost importance to conclude the work in the least possible time, as the bridge carries a huge volume of traffic, amounting to about three hundred train-movements a day

It was on account of the great weight of the modern locomotive and other equipment that the lighter bridge had to be replaced by a new one that would carry the load without danger. This remarkable engineering feat of the Union Pacific is a record performance for both length and weight, the four spans having a total length of 1,000 feet and a weight of approximately 3,850 tons

Both in point of speed and in the fact that a heavy traffic suffered only slight interruption, this feat is comparable to the quick exchange of bridges on New York's elevated lines, described in an earlier issue of the RAILROAD MAN'S MAGAZINE. The Union Pacific project was, of course, of greater magnitude, but no more spectacular than the Harlem River stunt where the tide was harnessed to float in a new double-deck bridge while the old structure was being floated out on barges, thus making way for the expanding needs of the great metropolis

THAT TURKEY DINNER ON THE SIDING.

BY CHARLES WESLEY SANDERS.

This Shack Deserved All He Got for Eating the Drover's Good Grub and Then Trying to Kid Him.

N the eighties train-crews used to watch the weather like a farmer with a field of hay just cut. The weather made a heap more difference in those days than it does now.

Of course a blizzard is no friend of the poor rail nowadays, but in those times it was a raging enemy. Going over the top of a train with your stick in one hand and trying to keep your lungs from being blown out with the other was no sport. With the wind hitting fifty or sixty miles, maybe, and the running-board covered with snow and ice, you could have given the whole deck to any tight-rope walker. You were glad to get hold of a brake-wheel and hang on, and just as glad to let go when you found how hard it twisted and how cold it was.

We came out of our terminal headed East one night when the storm king was running extra. It was along toward the first of March, and we had been having a spell of mild weather. Then I guess March began to get ready to come in like a menagerie.

We were hauling a mixed train of live-stock. We had a bunch of hogs and some cattle from the West, and seven cars of turkeys. The turkeys as usual were from Indiana.

We had two drovers on board. One of them was a little sawed-off man who wore a red muffler and a wool-lined corduroy coat and calf boots. He looked like one of the rubes you read about in so-called funny papers. He was a frisky little fellow, and this was his first trip. He was as excited as a kid taking its first train ride.

What interested him mostly was the engine, and he got permission from O'Day, who was hauling us, to ride in the cab. We didn't see much of him for a while after we pulled out.

The other drover was a big, solemn guy who you might have mistaken for an actor or a preacher or an auctioneer. He was lanky and bony, and he wore a long coat and a wide hat. Whatever you mistook him for you'd have seen right away, as I did, that he hailed from the bounding West.

I had kind of a grouch on because I had gone to bed at daylight and had been called before the sun was well set. Before going to bed I had drunk some ginger ale and eaten some sauerkraut. Maybe that had something to do with my bad temper.

I was hoping we wouldn't have many stops that night, for I didn't relish going back with the banner in the face of that wind and snow. I was glad that the big guy, as he sat in the wagon smoking a long, black stogy, was a quiet sort of individual.

I didn't feel like conversation myself. And I was equally glad that the brisk little man had elected himself assistant engineer.

We had a couple of meets that were timed A1, so I didn't have to go back, we having the right of way on account of being east-bound; and then the silent man and Bill, my conductor, and I had our supper. I didn't eat much.

Bill told me to hike to the head end and let Tommy Dolan, a buddy of mine, who was braking ahead, come back for his eats. I climbed up and headed into the wind, tacking about four points, I should say.

Whee, it was a bitter night! Heaven protect all the homeless, says I.

Half-way to the head end I came to the first car of turkeys. I don't know anything about those birds except to eat 'em, but I should have supposed they had gone to roost or laid themselves down or whatever it is they do.

But I guess they were crowded enough to keep warm, and I could hear them gawking and stirring down in the car.

All of a sudden came a vision to me of one of those Thanksgiving dinners ma used to dish up when I was a kid. I could just see the turkey steaming on the table on the big platter and dad saying grace, with me keeping a weather-eye on the bird. It made my mouth water.

Well, I got to the head end and told Tommy to beat it to the wagon and sing for his supper. He didn't lose any time starting, but he hadn't gone half a car length when I got an idea. I sent my voice rushing down the wind to him. He stopped and I balanced over to him

"Say," I says, "ever eat any turkey?"

"I was born in this country same as you," he says. "Why?"

"The little guy from Indiana is inquiring into the mysteries of the modern locomotive," I says. "Why can't we borrow one of his turkeys?"

"Will Bill stand for it?" says Tommy.

He hadn't been working for Bill as long as I had

"He'll only want all the white meat," I answers. "We'll give him half of it."

"You're on," says Tommy. "I'll take ten minutes to eat, and then I'll join you on top of the first coop from the wagon."

I was there to the second, and Tommy lifted up the door. I reached down till I felt a bunch of feathers. I got hold of a foot and lifted.

I guess the turkey was kind of surprised for a minute, for he didn't start anything till I got him on top the car and Tommy closed the door. Then he began.

He wasn't what you'd call a scientific fighter, that bird. He just used everything nature had given him. He kicked and bit and flapped his wings and hollered and everything. It took Tommy and I ten minutes to reduce him to captivity again. We were pretty near blown off the car doing it, too.

Say, he was a big one! I don't dare tell you how much I thought he weighed in at the ringside. You wouldn't believe me. But it took Tommy and me together, hands and feet, to get him back to the wagon. We opened the door and flopped him inside, still keeping our holds.

"Well," says Bill without cracking a smile, "you boys catch a wild turkey, did you?"

"Right out of the air," I says, with a wink at the solemn drover.

I saw Bill give that drover a long, searching look, but just then I didn't tumble. The drover didn't look at Bill. He looked at the turkey, and if possible he was a little more solemn than ever

"That's a mighty smart bird," he says. "What do you calculate on doing with him?"

"I thought I'd save him for next Fourth of July," I answers. "You're a farmer. What's the best way to kill him?"

"Oh!" he says. "Well, if that's the way of it, I might as well do it."

He hooks out a big jack-knife, picks up the turk with one hand, and goes out on the platform. In a few minutes he is back, and the bird is dead.

"If you must eat him," he says, "let me prepare him for you."

He takes off his long coat and fixes hot water and plucks the bird as neat as a pin. We had no place to roast him, so the drover puts him in the pot after cutting him up.

Tommy goes back to the head end and I spend my time wondering how long it will take the turk to cook. I can hardly wait. I guess I digested what was left of that sauerkraut in the first ten minutes.

Well, we reel along through the storm, doing the regular stunts, with nothing out of the way till we came to Andover. Then the cab-boy gives the toot-toot for brakes. I hustles up on top, and after a while we get stopped.

The lights of Andover are just ahead of us, and I see that the old block is winking white through the snow.

"Skin up ahead," Bill says, "an' see what he is stopping us on this windy plain for."

When I got up to the head end the engineer was foaming so I hardly dared speak to him, but I had my unpleasant duty to do.

"What's up?" I says.

"Why, the moon, I suppose, if you could see it," he answers, that being his idea of humor when he was mad. "What do you care?"

"Bill required me to investigate this stop," I says.

"Tell him we can hobble in to clear," he says. "After that we'll be right here for at least a minute. I got a busted cross-head. I've got to take down a main-rod. By the time I get that little job done, I will have to lay here for Five. Is that sufficient?"

"That 'll be very nice," I says, real joyful, for I could see yours truly sitting down to turkey while the train was in to clear.

The little drover from Indiana whose turk we had gobbled was hopping around, watching the engineer, and trying with all his might to get wise to this "cross-head" and "main-rod" dope. I knew he'd be busy for a while with that, and I was glad. I didn't want him coming back to the wagon about the time I had set my teeth into a drumstick.

Well, we got in to clear finally, and Bill started to the telegraph office to report the disaster. The solemn drover looks at me.

"Son," he says, "that turkey will be ready to eat in about ten minutes. I'll take a walk with Bill and be back. Do not shift the lid on the pot by the fraction of an inch."

"Can I take a sniff?" I says.

"Only that," says he.

I took a good long breath of that steam, and then I washed up with a foolish grin on my face. Instead of shoving a bum boarding-house lunch into me between stops, I was going to sit at table with turkey before me.

I heard a guy say once that from all evil some good springs. I'll take my evil in the shape of a busted cross-head at the exact minute.

About the time I got washed, Tommy comes back and has his sniff and washes up. Then we sat down and waited. It seemed a long time before Bill throws open the wagon door.

In he comes, and then the drover and then—

Well, I stared as she came in. It was Mollie Conway, the night operator at Andover. While I looked, the big drover bowed and indicated a seat for her.

I had joshed with Mollie before this, but I didn't dare josh her now, for she gave me a look that would have killed a flock of real wild turks. It seemed to say that if I so much as snickered she'd kill me.

The drover swept off his long coat again and washed his hands very carefully and began to serve the turkey. He served Mollie first, and Mollie blushed.

Well, for a while I lost interest in everything that was going on. I just ate! You can talk about your Thanksgiving dinners with all the trimmings, but that feast on the siding at Andover that stormy night was the best eats ever I sat down to.

And there was enough of it. Why, that turk had drumsticks like young hams, and the drover kindly served me a whole one. At last I leaned back with a violent sigh.

"Mollie," I says, "how do you like this?"

"Why, very well," says Mollie. "I think a man that can raise turkeys like this is doing a great work in the world."

I thought Mollie was joshing me as usual, and I laughed and said carelessly:

"I'll speak a good word for the bird, but I can't say as much for the man that raised them."

Mollie's brown eyes popped at me. The drover lifted his head, his fork half-way to his mouth.

"Why," I says, "the man is midway between a jumping-jack and a kid with his first toy balloon. He is the finest specimen of rube ever I laid eyes on. I guess he doesn't know anything but turks.

"And I'd lay a bet it's few of them he eats himself. He looks as if he had never had a square meal—one of these skinny guys. Now if I were running a turkey farm I'd keep the best ones to eat myself.

Darned if I'd raise good stuff just for other folks."

Mollie's eyes blazed right out then, like a bundle of straw that a match has been put to. Only that isn't quite right either, for her eyes weren't like a bundle of straw. They were big and brown.

I liked Mollie. If ever I was to get soft on a woman it 'd be Mollie. But not for mine.

"You're a fool," says Mollie.

Well, I saw that was no josh. Mollie was mad—mad clear through. Having finished, she jumps up. She looks at the drover.

"If you'll take me back to the station I'll be much obliged, Mr. Hornaday," she says. "The despatcher let me out for only thirty minutes. I'm sure I thank you very much for a perfectly delicious meal."

Anybody'd have thought she was just leaving a swell party, and that that drover was some millionaire in an open-front suit. So out she flounces, with the drover following her close.

At the door he turns. He looks at me, and he isn't solemn any more. He's ferocious. I expected him to show his teeth and give out a bark.

"You," he says, an' I almost jumped, "you wash them dishes and clean up what's left of that bird"

Then he slams the door shut. I sat there for a minute, looking at the door. I had been flagging for a number of years, and I was soon to get a wagon of my own.

Where did this hick get that kind of talk? He was only a rube.

"Say," I says to Bill, "what's the meaning of his princely air? And how does he get so strong with Mollie all of a sudden? Anybody'd think he was her long-lost love just come back with a golden hoard."

"It's his gift of gab," says Bill.

"Gift of gab?" I says. "Why, he hasn't spoke nine sentences since he hit this old wagon. What do you mean, gift of gab?"

"He doesn't waste his speech on men," Bill says. "He saves it for women. When we went down to the station, he stops outside the door as soon as he sees Mollie inside.

"He clears his throat, settles his hat, and shakes down a Prince Albert garment of his. Then he hooks his arm into mine and tows me into the station.

"'Introduce me,' he says.

"Mollie comes to the window and I give him a knock-down. Mollie, you know, doesn't usually get flustered even when the Twenty-Six comes along with the super on board. But when the stranger gives her a bow and says he is tickled to pieces to meet her, she blushes and smiles like she has never spoke to a man before.

"While I'm making out my report she opens the door of the telegraph-office and invites Mr. Hornaday inside. That's an honor, you know, boy. Mollie isn't suspicious of us guys at all, but you know she lives right up to the rules by keeping that door closed and locked. In goes Hornaday, and he no sooner gets himself settled than he begins to spiel to her.

"Well, he's some guy. Why, his old man owns the whole State of Montana! I guess it's Montana—maybe it's Idaho. Anyway, he's got acres and acres of land out there. Biggest ranch in the world, to judge from his talk. Far-as-the-eye-can-see stuff. And cattle—thousands of 'em. And money in the bank.

"The old man dies last year and this boy comes into it all. He doesn't have to be a drover if he doesn't want to. But he had this shipment of stock going across the pond and he thought he might as well accompany it. He wants to see London and Paris and Berlin and France and Africa—all those swell foreign places. And he was just cooking a turkey dinner, and if Mollie could get out for a while would she join him? Did she?"

"She did," I says. "And the big hick made out that it was his turkey and his dinner and Mollie was here on his invite, eh? Well, where do I come in, I'd like to know? Was I the good provider, or did he catch that wild bird on the wing? He makes me sick."

"He makes me sick, too," says Bill, covering his mouth with his hand. "It's all right for a man to hang a bluff; it's necessary in this life sometimes. But when I see a hick making up to a railroad girl like that it's going too far.

"I think he's a four flusher. I don't believe he owns enough ground to bury a yellow dog in. I think he's just a hand that one of those Westerners is sending with his stock. But it sure did make an impression on Mollie."

"Why didn't you call his bluff?" I says, pretty indignant. "You're an old rail. You going to let a hick put it over on the nicest little girl that ever touched a key?"

"He was telling Mollie how strong he was," says Bill. "He was telling how he had a fight with a tiger once—"

"Tiger?" I says. "There aren't any tigers in this country."

"Well, it was a mountain lion, then, or a panther or something," Bill says. I was only listening with one ear. I thought he said it was a tiger. Anyway, the animal trapped him and he killed it with his naked hands."

That was too much. As Bill says, it's all right for a man to hang a bluff; but fancy lying like that is too much. Did that solemn owl think he could come East and put it over on us guys like that? I got up.

"Where're you going?" says Bill.

"I'm going—" says I; but I didn't get any further.

The door was opened and in comes Mr. Hornaday. He'd mislaid that solemn look some place. He was actually grinning—like a regular chessy cat. I never saw a man grin quite so foolish as he did.

"Bill," he says, as if he'd known Bill all his life, "I'm going to ask you for a stopover. I'm going to stay here for a bit and visit Miss Conway. I'll get that passenger-train early in the morning and overtake you before you get in. I can overtake you, can't I, Bill?"

"The way we're moving now," Bill says, "you want to go back about twenty miles and get that passenger. Then you'll be sure to overtake us."

Mr. Hornaday laughed right out in meeting then. It was the most sickening laugh ever I heard. A regular "whugh, whugh, whugh" down in his chest.

"Well, I'll get you some time to-morrow," he says. "So long, Bill." Out he goes again. He didn't even look at me.

"Now's your chance," Bill says, as the door closed on him. "Follow him, sneak up behind him, and lay him out with a pin. He'll never know what struck him."

I'll give him time to get to the station," I says. "Then I'm going down there and have some fun with him. You'd better come along and see the fun."

"I think I'll stay right here; it's stormy," says Bill.

In five minutes I was on my way to the station. The wind was still a whooping and the snow riding it very merry. Up ahead I could see O'Day's light moving about as he consigned the busted engine to the boneyard.

I went into the station and draped myself at the window. Mollie and Mr. Hornaday were sitting looking at each other as foolish as a country boy and girl in a parlor. I expected that from the drover, for he was a mutt; but to see Mollie doing it too made me sick. I hate to see a good, game working-girl get mushy. It isn't good for the service.

"Well, Mollie-O," I says, "how's my girl to-night?"

I'd said that a hundred times before, and Mollie had always come right back at me. But now she looked up and her eyes were colder than all outdoors.

"What is it?" she says.

"B-r-r-r!" I says; and I turned up my coat-collar as if I were freezing.

"What is it?" says Mollie again.

Then I got mad. Mollie was one of us, you must remember. Her father had been an engineer when I was a kid in short pants. She knew the railroad game better than a lot of men know it. And here she was doing the haughty lady just because this rube of a drover was there!

"Aw, where do you get that stuff, Mollie?" I says. "You make mé weary when you don't make me laugh."

Then Mr. Hornaday rose in his place. He rose very deliberately, settling his tie and shaking down his long coat.

I looked at him. If a man can be pleased and displeased all at the same time, that's how he was. He walked over to the door, opened it, stepped outside, and closed it behind him.

As I remember things, I should say his

manner was real gentle. He walked up to me slow enough, but when he got within reaching-distance he was all action. He grabbed me by the collar, and I declare if he didn't lift me right off my feet; and I'm no child.

I understood then how he had handled that turk with one mitt. Holding me out in front of him and saying never a word, he walked to the outside door, opened that, and went outside, me with him

Out there he stepped into the path of light that the office-lamp made across the snowy platform. Then he did some kind of a jiu-jitsu and I landed across his knee. As I flopped down I saw Mollie looking through the window. She was grinning not smiling, but grinning; a nasty she-grin

Hornaday spanked me. I could have stood for anything but that. I've been in a few rough-and-tumble, knock-down-and-drag-out fights; but to be spanked! I couldn't help myself. That hick was all steel and buckskin in his arms.

When he had spanked me proper—and it hurt, too—he took me by the collar, walked out to the track with me, and dropped me face down. It was rather a rough drop, for the snow-plow had been through a bit ahead of us.

When I got to my feet I saw Mollie and Mr. Hornaday sitting as they had been inside the office. I had a notion to find a pin and heave it through the window, but I thought I'd better not.

If Mr. Hornaday had been mad I might have got mad; but his cool, careless way took the tucker out of me. I went back to the wagon.

When I went inside, Bill laid back and enjoyed himself.

"Laugh, you big calf," I says. "I hope you have a good time while it lasts."

He did. It was five minutes before he could speak.

"What did you do to him?" he says then.

"Do to him?" I says. "What could I do to him? And you knew it! Why didn't you tip me off that these rubes from the boundin' West—"

"Boundin' West my wristband!" says Bill. "You darned chump, Hornaday isn't from the bounding West. He's from bounding Indiana. He's with those seven cars of turkeys. It was *his* bird that you brought in here so blithe and gay! I guess he had a right to invite Mollie-O to the feast, didn't he?"

"Well," I says "who's with this Western stock we're hauling?"

"Why, the little guy in the red muffler that never saw an engine," says Bill; and he lay back and choked himself for a spell again.

"Where did you get all that dope you said he sprang on Mollie?" I asks

"Huh, huh, huh!" Bill chuckles. "I made it up. Reasonable, wasn't it?"

"It was so reasonable, as I learned, that I don't know now whether you're lying or not."

But on the twenty-fourth of the next December I got a dressed turkey from Indiana. A piece of paper was pinned to its wishbone. On the paper it said.

A wild one -right out of the air

The piece of paper wasn't signed, but I had seen Mollie's fist on train-orders many a time.

HOW WE ARE DOING "OUR BIT."

BY H. E. WALLER.

Conductor, Arkansas Division, Rock Island Lines.

I AM conserving equipment and am saving twenty-four hours on from one to eight cars every day—cars previously delayed twenty-four hours on account of being loaded after switch list made up or account billing not being filed with railroad agent. I often get the bill of lading and take it to agent where the shipper cannot do so, and insist that cars be billed.

FROGS.

Mexican railroads have reduced freight rates on corn almost fifty per cent owing to scarcity.

About 1,500 miles of road in Canada is operated or controlled by United States corporations.

New York conductor was sent to jail for fifty days for striking a passenger who had coughed in his face.

Erie has announced a plan whereby it proposes to give to employees the right to solicit promotion and advancement.

To assure safety of men in transit, railroads have adopted an average speed of twenty-five miles an hour for troop-trains.

Eight St. Louis men were electrocuted and three suffered severe shock when a wire cable broke and fell on an electric street-car cable.

One-third of the world's 713,000 miles of railways are owned or controlled by the governments of the countries in which they operate.

Latest improvement in stockyard conveniences is concrete bathtubs for pigs, installed in the Brawley, California, yards of the Southern Pacific.

Service flag of New York Central, representing employees of lines controlled by this road who are in the army and navy, bears the number 4,976.

Germany now has 713,000 freight-cars on its railroads as against 622,000 at the outbreak of the war. And it has 4,153 more locomotives than in August, 1914.

Patrick O'Brien, formerly a locomotive engineer on the Santa Fe Railroad, but now an aviator, was the first American to escape from a German prison camp

Average passenger-car can seat sixty-five persons, while average use is only eleven persons, according to President L. F. Loree, of the Delaware and Hudson Railroad.

On the Illinois Central system there are 480 speed restrictions. Every hamlet and city has its speed-limit, the great majority being six miles an hour for freight-trains.

Theft of a bridge did not surprise police of Lorain, Ohio, who also have been seeking a man who swiped a monument, one who stole door-knobs and another who took a flight of stairs.

Transfer of railroad stock from wealthy individuals to small investors has been so large that the rich poor men of the nation now have an ownership in the great roads that is the largest in history.

To economize further in use of passenger-car space, the Pennsylvania Railroad is now reserving the chairs in all club smoking-cars on express trains operated between New York and Philadelphia.

Section foreman of the Houston and Texas Central Railroad is reported to have retired from service recently at the age of seventy years, after forty-six years of service, with a fortune of $150,000.

E. B. Carson, general baggage-agent for the Southern Pacific at San Francisco, reports that in 1916 this company handled over the Pacific system alone 5,279,155 pieces of baggage, of which only thirty pieces were lost.

Committee of seven railroad officers has been appointed to take charge of the entire export traffic of the eastern railroads of the United States in iron and steel not yet fabricated, except that for the government.

In Bahia, east coast of Africa, every white resident has his private street-car, pushed by a native. Tracks lead through main street with switches to stores and clubs. Each owner has a switch to his yard where he stores his car.

Engineer operations, including equipment of the corps and railroad and other construction, for expeditionary force in France, will cost $892,000,000 in 1919, according to the estimate of Major-General William Black, chief of engineers.

R. R. SUPERSTITIONS, PRO AND CON.

ARE railroad men superstitious? Here we have the question in two aspects, one argument being made by Frank Kavanaugh, a working railroad man, and the other brief being held by A. R Pinci, a journalist of wide observation. Judging from the evidence they adduce, an impartial judge might come to the conclusion that although railroaders may be superstitious in other countries, they are not so, to any extraordinary extent, in this land of enlightenment; and that everywhere the credulity of the traveling public in matters of this sort surpasses the trainman's. Read these two subjoined papers and write us what you think, if so disposed. –EDITOR.

"PROVERBIAL SAILOR TAKES SECOND PLACE."

BY A. R. PINCI.

HE superstitions of railroad men throughout the world are many—so many that even the proverbial sailor, who is generally credited with being the most superstitious man in the world, must needs take second place. And as railroads are found everywhere, it appears that the railroader's subjectiveness to credulity regarding the supernatural, witchcraft, apparitions, omens, charms, and the like, is likewise universal. This brotherhood's beliefs have come to my notice at various times during my long reportorial career, mostly by hearsay, but easily verified, and also by personal experience.

Stopped Train to Balk a Curse.

Once, for instance, the train carrying me from Venice to Rome was stopped for the shortest possible moment at the foot of a mountain—one of the many in the Appenine range. The fact that the conductor crossed himself struck me forcefully, and my curiosity brought me the information that some years before a peasant had been struck by a train, and his injuries were such that he became a hunchback.

The details about the cause, whether the victim was a trespasser, were not clear, but his imprecation was that every trainman would become a hunchback for not stopping. Hence the stops.

In Russia I was told that when a woman is the first to enter a train bad luck is sure to come unless two men follow her within. The Spanish, on the other hand, believe that something green upon one's person will prevent misfortune, but they are peculiarly influenced if they see a cross-eyed person, or one whose glance is peculiarly steady. In this case they liken it to the Italian "evil eye" or "*jettatura*."

Friday, the thirteenth day of the month, black cats, cross-eyes, olive-oil spilling, mirror-breaking, lightning, corpses, left-handedness, coach numbers and their variations, the weather, are a few of the fantastic superstitions of railroad men.

Some of these superstitions, needless to say, are believed in by others than railroad employees, while the travelers themselves, especially professional men whose duty is to be on the road a good part of their time, have their own pet superstitions.

So far as I have been able to ascertain, numbers play no small part in all superstition, and an authority has compiled them, divided into three categories, lucky, bad, doubtful.

The numbers considered lucky are 1, 3, 4, 7, 10, 17, 19, 23, 24, 25, 27, 30, 31, 34, 37, 40, 46, 52, 55, 61, 64, 69, 70, and 73.

The numbers classed as bad are 2, 5, 6, 8, 12, 14, 15, 16, 18, 22, 26, 28, 32, 35, 36, 39, 41, 42, 43, 44, 48, 50, 53, 57, 59, 60, 62, 63, 66, 68, 71.

The doubtful numbers are 9, 11, 13, 20, 21, 29, 36, 45, 47, 49, 51, 54, 56, 58, 63, 65, 67, 72.

According to this, it would seem strange that 13 should be classed as doubtful, notwithstanding that some railroad men consider it lucky, and the majority of the people consider it unlucky.

It has been so often associated with bad luck, and the modern instances of misfortune coming to somebody, somewhere, somehow, through it have been cited so often by those adept at gathering curious data to prove odd theories, that no one knows how its superstition originated.

Life Makes Rail a Fatalist.

A railroad man, once quoted about the credulity of his profession, said that the otherwise keen-witted, hard-headed, bright, physically perfect railroad man, brought up in an environment of fatal chance, emphasizing human futility and powerlessness, finds a rich ground for omen, fetish, or charm.

By circumstance of a life surrounded by constant danger, he is a fatalist. He is always in the midst of a nerve tensing uncertainty. What the next second brings forth no one may surmise with certainty. Human ingenuity has attempted to meet with mechanical devices the dangers that ordinarily surround railroading, but despite that the element of chance is always great.

It is true that accident-insurance companies consider a traveler more safe in a railroad and offer him twice the amount for accidents in passenger-carrying vehicles, but the railroad man studies the accident statistics offered through the Interstate Commerce Commission or bases his views upon experience or personal observation, and says that his calling makes life cheap

There are always curves ahead; there are imperfect rails, steam pressure may be too great; a cylinder-head may blow off; a tampered switch may be struck next; an obstruction no larger than a fifty-pound iron transversely fixed, a landslide, or a cave-in, may offer death.

This does not take in consideration weak bridges, storms, hold up men, and the like. Even the "perfect" block system of signals causes trouble every day.

It is this sense of the unforeseen, the unexpected, the improbable, that enables railroad men to grasp at many quaint ideas as having an influence for or against chance. And while on the run he has sufficient leisure to ponder over the strange occurrences which to him may have some definite connection with the immediate future. And as the report is carried along it obtains variations.

The Post-Office Department, for instance, makes allowances each year for so many "lost" or damaged mail-sacks. Post-office inspectors, however, know better.

The mysterious disappearance of mail-sacks, especially those torn or mutilated in railroad accidents, has something to do with the treasured pieces hidden in the pockets of railway mail-clerks and crews. It is an offering to the altar of superstition, just as is the rabbit's foot, the elk's tooth, the broken coin, the lapel-flower, or the pronouncing of cabalistic words. At all events, it is argued, no harm is done.

13 Made Engine Unlucky.

There is a tradition, often mentioned by older to new employees of the Baltimore and Ohio Railroad, of a master mechanic who once waged a long and losing war with the thirteen and Friday superstitions. The locomotive was numbered 13, and made its first run on a Friday.

Needless to say, though many excuses other than the real one were made, he had difficulty in getting a crew. None of them would defy fate, and every one was ready to quit if compelled. It was no use, they agreed—to themselves.

One crew, more courageous than the others, agreed to tackle the trial run, but as an omen of good luck—nothing was said about the rest—they wished to place a horseshoe on the cow-catcher. The official

refused, and eventually he had his way. The 13 went out, and went out on Friday.

But an omnipresent hoodoo hovered over that locomotive from the start. Accident followed accident. It "did more stunts" than any unbroken colt has ever done. The first automobile ran like a watch compared to the 13. Its eccentricity was conspicuous enough and its stopping proclivities were soon known to every employee.

After stopping on easy grades, killing a cow or two, three men, and smashing into another engine, it jumped the rails below Cumberland while returning light to Baltimore. It was hauled out of the Potomac and then reconstructed. A different number was put on it, and thereafter it became one of the finest engines in service.

In a disastrous wreck in North Carolina or some adjacent State, a passenger-train plunged into the river from a weakened bridge. Three clerks in the mail-car were instantly killed when it collapsed, while another clerk, a veteran, escaped almost without a scratch.

Could he tell how it happened that he was the sole survivor of that car and one of the very few surviving the accident? Yes, he could; and he showed a frayed scrap of an old mail-sack which he had salvaged from another wreck.

Was It Coincidence?

Coincidence plays a strong part in this particular instance to give verisimilitude to the lucky piece. Three times had he been in wrecks, and each time he saved himself. Once he had left the treasured talisman at home, and rather than go on his run without, it, pleaded illness and returned. He "was not surprised" to learn that the train he did not board was ditched a few miles from the starting-point.

The rabbit's foot is of more general character than the scrap of mail-sack. Negro firemen are not the only ones to hug it to their sides. White switchmen have adopted it, as have engineers and even passengers.

It must be the usual graveyard rabbit killed in the dark of the moon at a specified time, but some consider that even this is not enough, and that its efficacy is made absolute only if it is placed together with a pencil and a coin. There are several variations of associated articles, including watch, tooth-brush, horseshoe-nail, pocket-mirror.

Many other trainmen never start on a trip without a flower in the buttonhole, usually a white one, or a white ribbon. Others wear a peculiar button, the insignia of their fraternal orders, and even a piece of red string, often, owing to regulations, almost invisible.

There are many tales of long-living conductors, engineers, and even Pullman porters, who ascribed their fortunate careers to the manifest influence of their individual charms. Some have several to provide for every known emergency, because it is said that certain charms are good only to protect from specified troubles.

Ghost Stories Abound.

Psychic manifestations also share their degree of popularity, or unpopularity, as the case may be. Ghosts figure prominently in every prominent line. Each system has its pet ghost and a popular spot where it manifests its psychic visitations.

A variation of this phenomenon is that caused by storms, when the lightning flitting along the tracks or along the handlebars paralleling the boiler forms designs which are supposed to portend any number of things. Some trainmen declare that the shapes of the flashes have a meaning of their own, but the one usually accepted is fantasmagorical, usually necrological, and portending death in a given time.

Stories about engineers and firemen who have died at a time foreseen and foretold by themselves are plentiful. A Baltimore engineer died on the appointed day four years afterward at the same spot where the lightning flashed; a Pennsylvania fireman was killed by lightning in his own home, while another, an engineer on the same road, saw his "warning number"—the year of his death—soon after he had his first engine.

When the stated time approached, he quit his job and waited for the summon, which came, it is said, as anticipated.

The specific case quoted about ghosts has to do with the engineer of a Western railroad who saw the ghost of his wife suddenly spring out of the darkness into the area of the headlight on the track ahead. He told the fireman, while bringing his train to a slow-down, that some one had said that the bridge ahead was washed out.

When they came to the river-shore they descended to investigate. The bridge, in fact, was gone.

Meanwhile, miles away, the engineer's wife, who was not dead, dreamed that her husband was in danger because the bridge had been washed away by a terrific storm. Yet no storm had caused the damage, but investigation showed that a whole section of the river-shore, mostly rock, had cracked and given way, carrying the bridge-head with it.

These, of course, pertain to the more important and scientific superstitions. There are, however, scores of others, of varying importance and doubtful source.

Lots of Miscellaneous Beliefs.

Putting on the left shoe before the right on the day of a run, cutting one's nails or hair that same day, stumbling on the steps, choking while drinking or eating, and dreaming of trouble, all on the day of the run, mean misfortune.

Permitting a cripple to enter first, a one-armed individual, a cross-eyed, red-haired child, a will-o'-the-wisp, a black cat, a white cat, letting the bell toll, counting the number of cars on another train, taking the place of an employee who has been accidentally killed until after three days have passed, the headlight going out, carrying a Bible, objecting if a corpse in the baggage-car points with its feet to the front, are some of the superstitions.

A left-handed fireman or engineer is viewed as a hoodoo by some trainmen and as a lucky companion by others. In some cases transfer to other runs have been asked because such an individual is given a berth, others instead request to be given a place by a left-handed or ambidextrous person.

As for travelers, they themselves have enough superstitions to warrant a thesaurus. Burning coffee after breakfast is better than an accident policy. Winding one's watch on the train means a safe journey.

Putting a wisp of straw in the trunk or bag protects it from loss and insures safety. Losing one's hat means money at destination, while passing a wreck means additional wealth. Handkerchiefs in one's pockets should always be unfolded, especially if a game of cards is to be played.

Spilling water in the dining-car is a sign of warning. To see trainmen eating a bony piece of meat is a lucky sign. To be awakened by a snoring cotraveler is a sign of business success in so far as the particular errand of that trip is concerned. If dust blows in one's eye while in the train it means good health for a year; if it blows while going to the train it is a sign of accident.

Credulity Takes Many Forms.

Italian peasants often cross themselves and say many prayers during the course of their trip. The Dutch clap hands at given times to prevent accident until the next clap.

The Germans like to take a nap, since they claim that to sleep is to be protected The French like to make merry, unless the presence on the train is on an errand of sadness, in which case to keep one's eyes closed as much as possible is supposed to do good.

Hungarians say that if in playing cards one should fall to the floor, it must not be picked up unless misfortune is quoted. The Greeks pronounce certain cabalistic words, perhaps as certain drummers in this country say "Abracadabra."

The Swiss make it a point to board a train left foot first.

Yet which is right and which is wrong?

Accidents follow, despite anything that may be said, done, or thought. Clearly the relationship between the supposed influence or influencing power and the thing that happens is not very well defined, but it is possible that one explanation covers the whole subject:

That the mental attitude after certain formulas have been observed is one of sat-

isfaction and ease, and with the mind at ease one works better, thus removing any tendency to nervousness which even those who do not believe in such things occasionally feel when another insists in their presence that such and such a thing means so and so.

To perform these simple rites, in accordance with one's own pet ideas, may help, at least oneself.

"MORE FETISHISM AMONG OTHER TRADES."

BY FRANK KAVANAUGH.

THE fat engineer climbed out of the left-hand side of the cab of his engine, oiled around, and, after putting the oil-can into the right-hand side of the gangway, where the fireman could get it and put it on the boiler-head rack, stood waiting for the conductor to come up with the orders.

"Why is it that engineers always climb out of the left-hand side of the cab and oil around from the left to the right sides?" I asked the fat engineer. "Is there a superstition or what?"

"See that?"

He affectionately patted the place where the midway belt of his overalls encircled a large waist.

Why He Oiled 'er from the Left Side.

"If I got out on the right-hand side here and oiled around the other way, I'd have to climb on from the other side. There's no platform there, and I'd have to step higher to get on. Then I'd have to lean out and get the flimsies from the conductor. So it saves wear and tear on my bones, and the Lord knows there's enough of it in the one hundred and eighty-eight miles I travel on this old teapot."

"So there's no superstition about it?" I queried.

"Nary a superstition. I haven't any," asserted the fat engineer.

I was just going to make a remark about the snow being excellent for the wheat—for nine and a half engineers in every ten throughout the Southwest have a farm or two and watch the wheat quotations as closely as any regular farmer—when a little black cat, scared at the noise of the injector, crept shyly across the track in front of the engine.

"Kitty, kitty," called the fat engineer coaxingly.

The cat looked as if it had half a notion of making friends with the big man. He went up and stroked its fur a time or two and then resumed his place at the gangway steps once more.

Nailed the Hogger by Accident.

"It's good luck for a black cat to cross in front of the engine if you stroke it after it does so," he remarked with all the seriousness in the world.

I had accidentally discovered his pet superstition.

Like the members of every hazardous occupation, railroad men are superstitious, but there seems to be no general one, except the one that wrecks run in cycles of three.

One reads of the supposed superstition about when a trainman stumbles over a rail he goes back and crosses the rail again to ward off disaster. Some time ago I was walking down the yards of a city in company with the division superintendent of the road.

He was an old man, had come up from the ranks, was director in a bank, and an officer in his church. In crossing a frog he stumbled over it.

"Wait a minute," he said as he turned back and crossed it carefully again.

"Superstition?" I laughed.

"Superstition your granny," he said. "I wanted to see *why* I stumbled over that frog—whether it was just carelessness or

whether there was something wrong with the frog. It's a safety-first act, my boy, and you'll see every other man whose business takes him around the yards do the same thing when he stumbles.

"Right here on this division during the past year more than three hundred cases have been reported of things that make against safety first by men doing just what I did."

It was another superstition story exploded.

One of the general superstitions among railroad men is that when one leaves his home for a shift's work he must not return and go indoors for something he has forgotten. Should he have to do so, the bad luck to follow will be nullified if he sits for even a second in a chair and lifts his feet from the floor.

This superstition is strongest in the South, where more or less of the negro "hoodooism" permeates the every-day life of the white man. There is a personal reason why I always religiously observe this practise, or, rather, reverence the superstition.

How I Acquired a Plaster Cast.

In the golden days of Dinny Sullivan's régime on the Choctaw Division of the "Katy," when two cars of air to a train were unusual and three cars a miracle, I was called one afternoon to go out on an "Atoka turn-around." From Atoka a branch ran up to Lehigh and Coalgate and the turn-arounds had to switch this branch

I left my rooming-house, got to the street, and suddenly recollected that I had left my "gat," revolver, gun, or whatever you choose to call it, on the dresser in my room. I went back for it.

A negro "mammy" was engaged in tidying the room. I grabbed the gun and started to leave.

"Don' go thataway," she begged. "Set down on de chair an' lif' yo' feet. It's bad luck to come fer things when you once started."

I laughed at her, but was in a hurry, and did not follow her advice.

"I never expects to see yo' agin," she said as I closed the door behind me.

She never did. Late that night, with the engine pushing a string of loaded coal-cars, we were coming down the hill into Atoka. I was riding the head car.

Two calves had picked the track for a sleeping-place, and their bodies derailed the car I was sitting on and several more followed it into the ditch The other members of the crew shoveled coal until they found me

I woke up in the hospital in Sedalia just after the physicians had put most of my body in plaster casts.

A Big Man Falls for This One.

So much for that superstition. But I observe it strictly even now, and so do others. I had business with a high executive official of a transcontinental railroad the other day.

We left his office together, and in the hall of the building he discovered he had forgotten his gloves. He returned to the office for them. I followed and watched. He got the gloves, then sat down for just a moment and lifted his feet from the floor.

I said nothing. I knew he had nullified that particular hoodoo.

Newspaper lore to the contrary, an engineer does not see before him the straight, lighted track. On the contrary, lights flicker; a shadow crosses before the engine; a low joint or faulty alinement throws the beam of light up and down or to the sides.

A dark spot in the center of the track may be the body of a man, or a hog, or perhaps it is only a shadow. The engineer has not time to call the attention of the fireman to such; the fireboy is a busy individual, and talking isn't an easy matter on an engine

That is one reason why no one but a man with steady nerves ever gets to the right-hand side of an engine, and that is why they are more or less superstitious.

Unreal, but True.

An engineer on the Missouri Pacific told me this story. It is so unreal that I investigated personally and found it true:

"At a portion of the division where the railroad follows the river, and the country

dirt road also does, and in doing so crosses the railroad now and then, I had an accident. A man in an automobile tried to cross ahead of my train, and failed.

"The engine struck the machine center, and when I stopped the train what was left of the auto could have been sifted through my wife's colander. The man wasn't hurt, but he was the angriest person I have ever seen. He swore he would "get" me sooner or later.

"Two or three days after the occurrence I was put on a faster train and made the run over the scene of the accident at approximately midnight going south.

Sensed a Man in Ambush.

"Approaching the place, I naturally remembered the man's threats and looked to one side of the right-of-way. Sure enough, from the cover of a large tree I saw a form creep, half stooping.

"I could see his hands but dimly, but the weapon he carried, a very long one, was plain enough. I imagined I could see the hole in the barrel of the rifle he carried.

"Then it all came back to me. That afternoon I had left my home, forgetting a clean suit of overalls. I had returned for them. On the road to the roundhouse a cross-eyed man had stared at me. A black cat ran before the engine as I was backing out of the roundhouse. The master mechanic owned it.

"All this went through my mind in the half second I watched the man come from behind the tree. I stooped so that if he sent a bullet toward me it would go harmlessly above me.

"When I looked up an instant after, the headlight had ceased to shine on the spot. All the place was in darkness. I was so nervous during the rest of the trip that I felt I was doing the people I pulled a wrong to run the train, fearing I might do something that would endanger their lives.

"The next day, coming back, I watched the place closely, but it was daylight then, and there was no sign of the man who had threatened to take my life.

"At the home end of the division I laid over one night, as was my custom, and again took the train out. This time nothing untoward happened, but when I approached the scene of the accident I watched closely.

"Sure enough, when we were near the tree at the side of the track, the man came out from behind it, holding a gun. Again I dodged, and again I was a bundle of nerves during the remainder of the run.

"When I returned home I determined to go and see the man whose auto I had smashed, and, if he would consent, have it out with him. I was no physical coward. I was merely afraid of doing something to endanger the lives of the passengers I pulled. I laid off one trip, caught a train down to where the man lived, and hunted him up.

"He had recovered from his anger, and told me I was not to blame. The claim-agent, furthermore, had paid him a sum in settlement. He was very friendly.

"'Who is it, then,' I asked, 'that stands behind a tree near that crossing where I hit your machine, and points a gun at me when I pass?'

"'Not I, I assure you,' the victim of the accident replied. 'Why, before I reached home, my burst of temper was all gone. I haven't owned a gun for years.'

"'I'm going to investigate to-night,' I asserted. 'It's my run, and no one knows I've laid off except one or two up at the end of the division, and the assassin may be there.'

"'I'll go with you,' the man said. 'I've a little curiosity to see who it is myself. He might have killed you, and had he done so, circumstantial evidence would have all been against me.'

Laid for the Sniper.

"With an officer of the law who sported a big gun and a bigger badge we went to the place, arriving there ten minutes before my train was due. We concealed ourselves near by, but not too close.

"The train came. When its full light struck the tree it made a silhouette of it against the darker background. As the engine came nearer the man, or shadow, came out sure enough, with rifle and all. In a second the light had left the tree and all was in darkness.

"The officer fired as the man disappeared. The train drowned whatever scream he uttered.

"With the aid of the officer's flash-light we went to the tree. There was no sign of a man or blood or rifle. As we were looking around, a freight following the passenger flashed its light upon the tree.

"We stood back and watched. Then we saw the assassin. It was a dead limb which terminated in a small branch. The lights made it appear as if it was a man creeping from behind the tree. The end of the limb, the small termination, appeared to be a rifle in the uncertain, shaky light.

"The officer grumbled as we walked back to town. The man whose auto was smashed laughed. I went back and went out on my next run with a light heart.

"As I was climbing onto the engine the master mechanic's black cat walked in front of me. I kicked it across the roundhouse

"'That means bad luck,' my fireman protested.

"'Yes—to the cat,' I replied."

Thus endeth the story of that particular engine-runner's superstition

Old-Timers Wouldn't Stand for Photos.

Among the older railroad men it was considered bad luck or a violation of the ethics of their craft to have a personal photograph taken. This has died out, as any one who reads the yellow journals can see.

It is rare that one does not find a trainman's picture in one. He has either merited quick promotion, been the hero of a wreck, or married an heiress. In the old days it was tabu. It was a mild sort of superstition.

Among operators, especially those who man the lonesome stations, there is what is known as the "fantom call." It originates in their brain, and is the result of the loneliness rather than any superstition.

The wires, wind-swept, sing and rattle, and men imagine many things. I have met operators who could not sleep alone in a telegraph office after months at a lonesome station.

One of the worst cases of this sort that has come under my personal observation was that of a man named Barr, who worked opposite me at a little station in Arizona in 1896. A "ham" at the time, I was not competent to hold a station, but I did very well OSing trains at night.

I also ran the pump, that being part of the duties of the two operators there. Barr never could learn to work the old-fashioned Penberthy injector that supplied the pumping boiler with water. As a result I did all the pumping and Barr most of the telegraphing

Wouldn't Cash His Pay-Checks.

With the exception of several he had cashed with which to purchase supplies, Barr kept his pay-checks in a clip which hung from the wall. I am not sure how long he had been there, but several of the checks were more than two years old.

I thought this a mild form of insanity with him, and as otherwise he was pleasant and companionable, we grew to be friends

With several other lonesome operators, I made it a point to go into Yuma just after pay-day each month and get supplies. While there I am compelled to admit we sometimes gave Rule G the merry ha-ha. I was young then and foolish.

One afternoon I returned from my usual monthly trip with several things Barr had asked me to get. After I was through checking up with him I went out and saw the tank contained scarcely two feet of water.

"You pump it full and I'll stay on duty to-night as long as I can stand it—then wake you," Barr said.

My shift should have been from seven in the evening until seven in the morning.

To guard against snake-bites, I had brought with me a quart of Yuma whisky. This I placed underneath my cot and went to the pump. Barr never drank; neither did he lecture me for doing so.

It was midnight when the tank was full. I pulled the fire and went inside the station. Since nightfall the wind had risen.

The river, one hundred feet below the level of the station, was whipped into foam; through the air the sand blew like shot.

The target-lights of the switches at each end of the passing-track were not visible

when I made a run for the few feet that separated the pump-house from the telegraph office. The telegraph wires clattered like castanets.

Barr was reading a magazine I had brought from Yuma when I entered.

Barr Seemed Human at Midnight.

"There's some hot coffee on the stove there, old man," he said, looking up. "Drink some, and then turn in. The wires are down each way—can't get a thing.

"I'll take a nap. There's no use staying awake when no one can call us."

I don't know how long I slept. I was awakened by a crash in the telegraph office. Where I slept adjoined it, and the door had been left open.

I stumbled out, rubbing my eyes. Barr, half-dressed, wild-eyed, and crazy, was beating the telegraph-table with a chair. Already the instruments thereon had been destroyed. He turned as I asked what was the matter.

"Hear them! Hear them! They are calling! Listen: 'Come! Come! Come!' That's what they say, and they are all bloody!"

He was silent for a moment while I listened. The clatter of the wires was the only thing that broke the silence. I really did seem to hear a few dots and then a couple of dashes, but I knew it was just the uneven clatter of the wind-swept wires.

"Hear them?" the crazy operator asked. "And they're all bloody—all bloody!"

"Get in there and go to bed, Barr," I commanded, although he was senior man of the station. "There's nothing here to hurt you. The storm has given you nerves."

"Fantom Call" Got Him at Last.

"They're calling me; come—come—come!" Barr yelled as he brought the chair down on the table with a crash.

Just then a harder gust of wind than ever hit the station and shook it. Barr changed the direction of the chair he had in his hand and with two blows knocked the window in front of the telegraph table into smithereens. Throwing the chair through the window into the darkness, before I could say a word or stop him he had followed it.

I ran after him, calling, but before I was twenty feet from the building the sand-storm drove me back. It was impossible to live in such a storm.

I composed myself as best I could and set what of the office I could to rights. I even patched and adjusted one of the instruments so that should the line right itself again I could let the despatcher know what the trouble was.

An hour later a train slowly pulled into the station, "feeling its way." I related the circumstances and the crew helped hunt Barr.

We found him a hundred yards from the station, almost covered with sand—dead. At my request the crew loaded him on the train and took the body away. I stayed.

After the train had pulled out I again started to put the office to rights. Suddenly I thought of my quart of Yuma whisky, and went to take a drink. It was gone.

Efforts to find Barr's relatives failed, and the checks went back to the company, with the exception of what the coroner grabbed The desert had played too long with a man

Do Wrecks Come in Cycles of Three?

The fallacy about three wrecks in a cycle is dying out. There never was much belief in this. It originated with the section men when the Irish and Germans manned the hand-car and shovel.

Now that the heirs of these hardy pioneers are politicians and suffragettes, or just plain business men, and the section-crews are composed of natives of eastern Europe or Mexico, one hears very little about it. The wreck cycle of three has found a place in the bone-yard of forgotten things.

The Mexicans, who compose a large portion of the railway laborers of the Southwest, will not work under a cross-eyed foreman for any length of time. The only explanation I have ever had of this was what an old Mexican told me:

"There are no little rests when you work for a boss that looks two ways at once."

The 13 superstition is not rife among railroad men. An instance proving this fact occurred several years ago on the Houston and Texas Central Railroad.

Their crack train, as far as speed goes, is the train leased by the Dallas *News*, which leaves Dallas as soon as the last edition of the paper is out, and runs to Denison, where connection is made with the outgoing trains through Oklahoma. This train has been known to make the seventy-two miles between Dallas and Denison in seventy-two minutes, making four stops *en route*. Its regular schedule is slower, however.

For years it has been pulled by engine 13. One morning an extra engine tried to steal the siding at Howe on this train. They met on a reverse curve between Howe and Sherman, and the engineer and fireman of the 13 were killed.

Rush of Bids for Engine 13.

This was a preferred run, and when it was advertised as vacant there was such a rush of bids for it that the books of the company for years back had to be consulted to determine who was the oldest bidder. The 13 was repaired and put back to work and when I heard from it last it still made the one hundred and forty-four miles every day.

After all it's doubtful whether there are as many superstitious men among railroaders as there are among men in other useful occupations.

HOW WE ARE DOING "OUR BIT"

BY J. P. CAREY,

Superintendent, Kansas Division, Union Pacific Railroad.

IN order to answer the question, "What am I doing to help win the war?" I will have to set out what the Union Pacific Railroad is doing, because as superintendent of the Union Pacific Railroad in Kansas my work is in reality the work of the railroad itself.

I have been giving special attention to the matter of heavier loading of freight cars and the prompt movement of all classes of freight equipment. It has been my special care to look after the prompt handling of all government freight, troop-trains, etc. Camp Funston, Kansas, is located on the Kansas Division of the Union Pacific Railroad, and it has put added zest into my work to realize that when my division makes the best record in the matter of railroad efficiency it is giving at the same time the best possible patriotic service.

Approximately fifty thousand men are to be trained at Camp Funston and the Union Pacific Railroad has handled all the freight necessary to bring the construction material and supplies to this big cantonment. We have had to build a second track for a distance of twenty miles in order to properly handle this traffic, and additional side-tracks, station facilities, subway structures, etc., have had to be built. All of this construction work has required an appropriation of approximately $1,250,000.

For the past three months we have had to handle twice daily between Camp Funston and the adjoining towns, between three and four thousand workmen employed on the cantonment buildings, whom we have been able so far to take care of without complaint, getting the men at work promptly in the morning and at home in the evening. On several occasions we have had to run special freight-trains in order to get the much needed equipment at the camp, and in order to do this we have very often found it necessary to build new tracks, change train-schedules and install new train service practically overnight.

In other words, all of our resources have been placed at the command of Major-General Leonard H. Wood, with whom it has been our pleasure to cooperate. We will continue to render the best service at our command in order that Camp Funston may have the reputation of being the best of all the national army cantonments.

By the Light of the Lantern

Ask us what you want to know

WE want to be as useful as possible to our readers, but, because of the great popularity of this department, we are obliged to impose certain restrictions. It is limited to the answering of questions of an informative, technical, or historical nature concerning the railroad business and allied occupations only. We cannot answer requests for positions or give information regarding employment. All letters should be signed with the full name of the writer, as an indication of his good faith. We will print only his initials. The editor begs that readers sending in questions will not be disappointed if the answers do not appear as early as expected. It frequently takes weeks to secure correct answers, owing to the complexity of the questions. All questions are answered free of charge. The editor earnestly requests his readers to bring immediately to his attention any errors they may find in this department. He reserves the right to refrain from answering any question.

AGE-LIMIT EXTENSIONS.

H. A. H., Oelwein, Iowa.—So many of the young men of the country have been, or will be, called into military service that a large number of the railroads have suspended their regulations in regard to the age limit for employment. We cannot furnish a list and the regulations of the different roads, but those interested should make application at the nearest division headquarters, where the superintendent or his assistants will furnish full particulars.

Where the new regulations are now in effect, the change of age limits for employment covers all branches of railroad service. For instance, on the Pennsylvania system the rules heretofore prohibited the employment of men above the age of forty-five years for any work whatever.

The new rule since adopted to meet war conditions permits the employment of persons between forty five and seventy years during the period of the war and for six months thereafter. Elsewhere the minimum age limit of twenty one years for those engaged in the operation of trains has been reduced to eighteen years.

On roads where the pension system is in force, the employment of men above forty-five years does not carry with it the privileges of the pension system.

We cannot answer questions in this department as to the exact parties to whom applications should be made.

TRAIN-ORDERS.

H. T., Pittsburgh, Pennsylvania.—All railroads may be said to use train-orders. As referred to in the book of rules governing the operation of trains, the term "train-order" means the instructions which are written on printed authorized forms or blanks governing train movements, usually those not provided for by the time-table.

There are a number of different blank forms, the use of which are provided for in the rules. Each order as it is issued is given a number, and is addressed to those who are to execute it, with the name of the place at which the copy is received.

Train-orders are addressed to the conductor and engineer of the train. The time the order is made "complete" must be shown, and also the initials of the superintendent, despatcher, or whoever is authorized to direct train movements.

At telegraph or telephone stations a fixed semaphore or other signal is provided to indicate to a train that it must stop there to receive a telegraph or telephone order affecting its right to the road.

The operator at the station usually operates this signal manually, but with the selective telegraph or telephone system of train-despatching, the signal is controlled by a selector operated over the telegraph or telephone circuit by the despatcher from a distant point. With this system an answer-back mechanism is provided which indicates over the circuit to the despatcher that the signal is set at stop.

LONGEST STRAIGHT LINE.

R. W. A. S., Kew Gardens, Surrey, England.—We thank you for your letter commenting on our answer in the November, 1917, issue in regard to the longest straight and level track.

A number of press reports in regard to the opening of the East-West Line of Australia from Port Augusta to Kalgoorlie on October 22 last reports a straight and level track on this road 300 miles long, and we would certainly have made some reference to this stretch of line, but the answer was written weeks before it came to our attention.

If the reports are correct, you are right enough in assuming that this is the longest straight and

level stretch of line, but you can never be certain with such questions.

Since the receipt of your letter we have consulted several profiles of the East-West Line published in the Australian papers, and cannot see where those 300 miles of straight and level track come in.

Surely it must be somewhere between the stations of Ooldea and Loongana or Rawlina, and if so the scales must be inaccurate, to say the least.

Like yourself, we would be glad to accept this stretch of road as the longest straight and level track in the world, if that would settle this question for a while, at least

It seems to be an important topic with the readers of the RAILROAD MAN'S MAGAZINE, but we cannot see any practical value in the issue. We thank you again for your kindly interest in the Light of the Lantern Department.

TRAIN-ORDER FORMS.

L. R H., Youngstown, Ohio.—Nearly all roads operate under the standard code of train rules of the American Railway Association. The forms, or blanks, used for train-orders are standards recommended under these rules and practises. Some roads do not use all of the forms, while others restrict the various purposes for which the different blanks are to be used.

NEGRO FIREMEN.

H. J. M., Balboa, Panama.—Cannot quote exact figures. The majority of the firemen on the Atlantic Coast Line are negroes. It is our opinion, and we are very nearly correct, that less than 30 per cent of the firemen on this road are white men.

The men engaged as engineers on this road come from all parts of the United States, and when occasion demands, promotion from the ranks of the white firemen is made; but we understand that no firemen are promoted to be engineers on this road unless they have fired at least three years.

Cannot enumerate the various classes of locomotives in use on this road. Practically all classes of engines are employed.

The division master mechanics and their locations are: P. J. Meade, Rocky Mount, North Carolina; W. J. Pamplin, Waycross, Georgia; J. Paul, High Springs, Florida; E. J. Smith, Florence, South Carolina; H. R Stevens, Sandford, Florida.

Glad to be of service to you. Do not hesitate to ask any reasonable question.

MASTER MECHANICS.

G. E. N., Palatka, Florida.—The master mechanics on the Seaboard Air Line and their locations are as follows: A. C. Adams, Raleigh, North Carolina; R. A. Crofton, Savannah, Georgia; J. J. Hanlin, Howels, Georgia; H. H. Parker, Jacksonville, Florida; T. L. Reed, Hamlet, North Carolina; J. W. Watson, assistant, Andrews, South Carolina.

Some of the master mechanics of the Louisville and Nashville are: B. W. Blue, assistant, Lexington, Kentucky; C J. Bodemar, New Decatur, Alabama; J. G. Clifford, Louisville, Kentucky; B. E. Dupont, assistant, South Louisville, Kentucky; J. L. Enock, Nashville, Tennessee; H. Feather, Corbin, Kentucky; W. N. Green, assistant, Boyles, Alabama; Henry Hardie, Howell, Indiana; H. S. Hills, Ravenna, Kentucky; W. E. Hunter, Etowah, Tennessee; J. D. Maxwell, Mobile, Alabama; J. A. McFerran, Covington, Kentucky; A. A. McGregor, Boyles, Alabama; F. J. Monahan, Paris, Tennessee; T. A. Nelson, assistant, Montgomery, Alabama; E. O. Rollings, South Louisville, Kentucky; Pat Ryan, Russellville, Kentucky; J. E. White, Pensacola, Florida.

SPEED RECORDS.

E. L. C., Oakland, California.—Thanks for your very interesting letter. Have you read our answer to W. E. S., in the December issue?

We have no doubt whatever that you are a student of speed records, especially those of the Great Western Railway of England, and so are we, or trying to be. However, we cannot be on the job timing every train when it is out for a record run, and must draw our information from published reports, *et cetera*

We would not publish a letter from one of the interested correspondents to these columns because he claimed the fastest time ever made for the run between London and Bristol, 118½ miles in 90 minutes, and another in approximately the same time, for the reason that our files indicated that the run was made in 84 minutes in 1904

Now you tell us that the run was never made in less than 99 minutes and 46 seconds, which may be true. Our best efforts are exerted to keep the speed merchants from running away with themselves, and for that reason we are constantly being attacked on this subject. At the same time, an effort is made to give credence to published reports of record runs, if in our judgment the thing is at all feasible

The roadbed, construction, *et cetera*, of the Great Western of England, the foundations of which may be attributed to the great Brunel, will compare most favorably with anything in the world, and the system is admirably suited for high-speed runs.

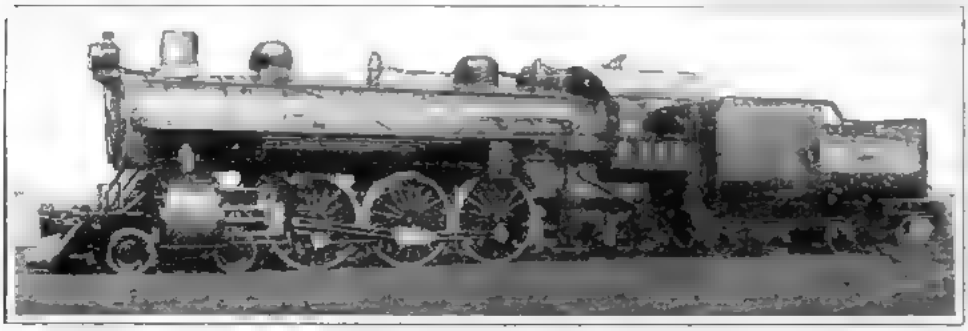
The record which you quote was a section of one of the most notable speed records in history, when, on May 9, 1904, a train over the Great Western ran 246 miles between Millbay Junction and Paddington in 227 minutes. This train consisted of five cars and the engine, and the load was American mails and specie exclusively.

The record for the whole run, as well as the section between Bristol and Paddington, which is under discussion, was probably official timing With reasonable allowances for lighter loads, and for efforts at speed records for the section in-

volved, you will agree that it is reasonable for us to look for some mighty performance

The various authorities which you mention we draw on constantly. Mr C. Rous Marten has unquestionably attained a reputation as a timer of trains in England, but it is only recently that we have seen even his figures being seriously criticised

Under the circumstances, what can one expect where such questions are involved? Why, we have in preparation a special article dealing with fast trains, not record runs, but the fast schedules of the world, and have had the cooperation of unquestioned authorities in Continental Europe, Great Britain, and America; but we do not agree with them in a number of instances, or it would have been presented to the readers of the RAILROAD MAN'S MAGAZINE before this



ONE OF THE PACIFIC TYPE LOCOMOTIVES, BUILT AT THE SACRAMENTO SHOPS OF THE SOUTHERN PACIFIC COMPANY. IT IS USED IN PASSENGER SERVICE, BURNS OIL, AND DEVELOPS A TRACTIVE EFFORT OF 31,420 POUNDS.

SOUTHERN PACIFIC ENGINES.

J. W., San Francisco, California.—For some time there has been a most unusually sharp demand for locomotives for use in this country, due to the fact that the government has preempted all the resources and energies of the regular builders; and, great as their capacities are, the locomotive builders are not able to meet the demand for engines to be used on the railways of the United States

Under the circumstances, those roads which have equipment suitable for building their own locomotives have turned their attention to this direction. Among others is the Southern Pacific Company, and Engine 2,459 is one of the production of the company's shops at Sacramento, California.

At the time this answer is written no less than nine Consolidation and two Pacific type locomotives have been turned out at these shops. Engine 2,459, in which you are interested, is one of the Pacific type locomotives. It is used in passenger service, burns oil, and develops a tractive effort of 31,420 pounds

The weight of this engine in working order is 234,000 pounds. The weight on the driving-wheels is 150,400 pounds; this puts 38,000 pounds on the engine truck, and the trailing truck carries 45,800 pounds

The weight of the engine and tender in full working order and taken together is 372,300 pounds. The wheel-base of engine and tender is 63 feet ¼ inch. Some of the other details of this engine are:

Cylinders 22 by 28 inches; 12-inch piston-valves; driving-wheels, 77 inches in diameter; straight-style boiler with a working pressure of 210 pounds per square inch; total heating surface, 2,745 square feet; superheating surface, 550 square feet; all things considered the equivalent heating surface amounts to 3,570 square feet; the grate area is 40½ square feet

The tender, which is of the Vanderbilt type, has a capacity of 7,000 gallons of water and 2,940 gallons of oil fuel.

DOUBLE-HEADING.

S. J. T., Schofield Barracks, Hawaii.—When two locomotives are employed to haul a train, or double-heading, as it is called, the control of the air-brake system is left with the head, or leading, engineer.

A RULE.

E. H. R., Atlanta, Georgia.—The rule providing that the engines of freight-trains of more than ten cars shall be cut off before taking water at a plug or water-station not less than four car-lengths from the point where the water is to be taken on is not peculiar to the road that you mention

It is common practise on a number of roads, and is designed for varying reasons, some of which are to meet local conditions

For instance, ashpits are very often located in close proximity to the watering station, and where the ashes are being removed by manual power this rule permits the carrying on of the work without interruption.

However, the basic idea is to prevent the damage to freight due to rough stops in handling of the train. The handling of long freight-trains requires the art of a highly skilled man

Very often an engineer would be compelled to resort to the emergency to bring the train to a stop anywhere near the spout, with the result that severe damage could be done to the load behind him.

OIL-BURNING RAILWAYS.

A. J. R., Delaware, Ohio.—Cannot publish a complete list of all the railways using oil as fuel. Nearly all the roads of the Southwest use oil fuel, at least on some of their divisions. Some of the lines are: the Atchison, Topeka and Santa Fe; Southern Pacific; St. Louis, Iron Mountain and Southern; Missouri Pacific; Kansas City Southern, and others.

FAIRLIE ENGINES.

J. W. G., New York City.—In 1871 Mason built a double-ended locomotive called the "Janus," then spoken of as being the Fairlie type of engine. The engine was bought by the Lehigh Valley Railroad Company, and performed very satisfactory service on the heavy grades, but the railroads were not then prepared to purchase other engines of that character.

Double-ended Fairlie locomotives are popular in some countries where heavy gradients have to be worked, but they have not hitherto met with favor in the United States. The Denver and Rio Grande Railroad Company purchased two of them when the road was first opened, but they never were liked, and it was difficult getting engineers to run them.

The story is told of an Englishman who went to Denver looking for a job being hired specially to run one of the Fairlie engines. He was stationed at the foot of a long, steep grade, the Fairlie acting as a pusher.

One day this Englishman, who had not been accustomed to the guidance of a time-table, intruded upon the time of a passenger-train, and orders were issued to suspend him for ten days. Another engineer, who did not know anything about double-enders, was sent to relieve the Englishman.

He reached the engine in due course, and proceeded to question the engineer in charge as to how the machine was worked. After listening patiently to explanations as to the use of certain levers, rods, handles, lubricators, *et cetera*, he turned to the man he was going to relieve and said:

"You keep running this engine and I'll take the ten days."

From this it must not be inferred that the Fairlie type locomotive was not a success. It is still considered by many users abroad to be the best of its kind for certain classes of service.

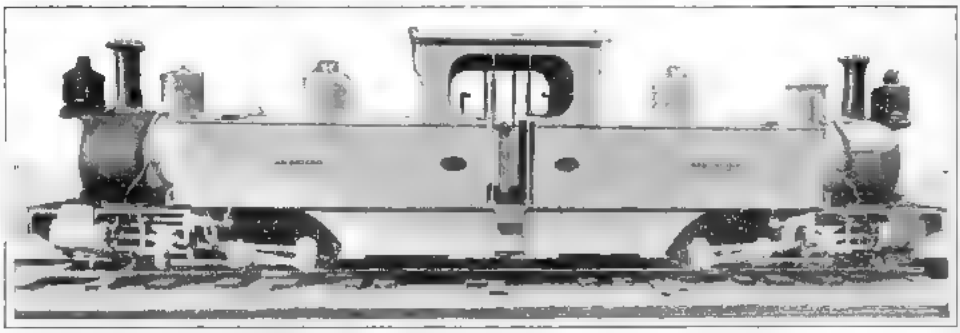
Through the kindness of Mr. A. H. Gilling, general manager of the Yorkshire Engine Company, Ltd., of Sheffield, England, where the original Fairlie engine was built, we are able to illustrate two locomotives of this type. The engine San Antonio is narrow gage, 2 feet 6 inches, and was built for the Junin Railway Company of Chile, South America. The other was built for the Nitrate Railways Company of the same country, and is of standard 4 feet 8½ inches gage. Some of the principal dimensions of the San Antonio are:

Type	0 6 6 0 T
Gage on Rails	2 ft. 6 in.
CYLINDERS.	
Diameter	1 ft. 0½ in.
Stroke	1 ft. 4 in.
WHEELS.	
Diameter of Wheels	2 ft. 6 in.
WHEELBASE.	
Rigid	6 ft. 0 in.
Total	20 ft. 4½ in.
BOILERS.	
Maximum External Diameter	3 ft. 6 in.
Length of Barrel (each)	9 ft. 3¾ in.
Length of Firebox Shell (each)	4 ft. 1⅞ in.
Number of Tubes (each)	106
External Diameter of Tubes	1¾ in.
Working pressure per Square inch	160 lbs.
HEATING SURFACE.	
In Tubes	930 sq. ft.
In Firebox	117 sq. ft.
Total	1,047 sq. ft.
Grate area	21.66 sq. ft.
WEIGHT.	
In working order	52 tons 2 cwt.
WATER AND COAL CAPACITY.	
Water	1,500 gallons.
Coal	2 tons.
CLEARANCE LIMITS.	
Maximum Height	10 ft. 7 in.
Maximum Width	8 ft. 2⅜ in.
Length over all	40 ft. 6 in.
TRACTIVE EFFORT.	
Maximum	22,665 lbs.
Per lb. M. E. P. in cylinders	160.6 lbs.

NOTE: This design has two separate boilers.

The principal dimensions of the Nitrate Railway Company's engine are:

Type	2 6 6 2
Gage of Rails	4 ft. 8½ in.
CYLINDERS.	
Diameter	1 ft. 5 in.
Stroke	1 ft. 10 in.
WHEELS.	
Diameter of Truck Wheels	2 ft. 0 in.
Diameter of Coupled Wheels	3 ft. 9 in.
WHEELBASE.	
Rigid	8 ft. 6 in.
Total	44 ft. 0 in.
BOILER.	
Maximum External Diameter	4 ft. 0⅛ in.
Length of each Barrel	11 ft. 4 in.
Length of Firebox Shell	10 ft. 4 in.
Number of Tubes	330
External Diameter of Tubes	1⅞ in.
Working pressure per Square inch	160 lbs.



THE SAN ANTONIO, ILLUSTRATED HERE, IS ONE OF THE FAIRLIE ENGINES, BUILT FOR THE JUNIN RAILWAY COMPANY OF CHILE, AND IS OF NARROW GAGE

HEATING SURFACE	
In Tubes	1,885 sq ft
In Firebox	192.5 sq. ft.
Total	2,075.5 sq. ft.
Grate area	35.5 sq. ft
WEIGHT.	
In working order	85 tons
WATER AND COAL CAPACITY	
Water	2,660 gallons
Coal	2¼ tons
CLEARANCE LIMITS.	
Maximum Height	13 ft. 6 in.
Maximum Width	10 ft 0 in
Length over all	52 ft. 0 in
TRACTIVE EFFORT.	
Maximum	38,420 lbs
Per lb. M E P. in cylinders	283.5 lbs

COUNTERBALANCING.

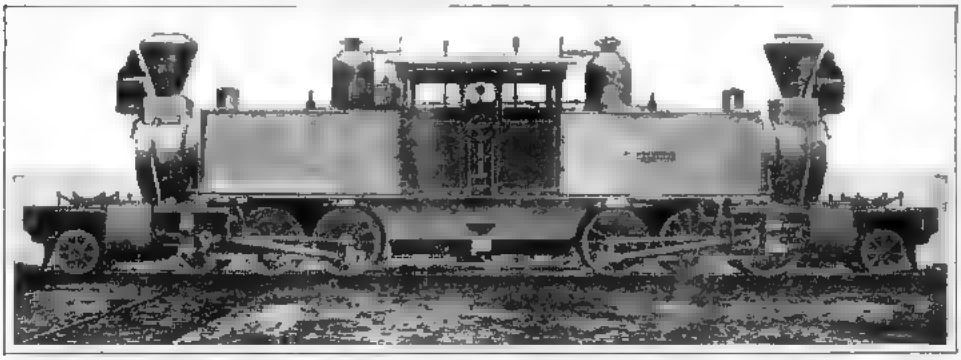
J. E. A., Reading, Massachusetts.—The problem of counterbalancing the reciprocating parts of the locomotive is one where the methods used and designs are largely a matter peculiar to each railroad, as the designs, weights, and speeds of locomotives are as various as the conditions under which they operate

In counterbalancing the parts to be considered are the piston-head, rod, and nut; the cross-head, cross-head key, pin, and nuts, one half of the total weight of the main rod; also the arms and link fastened to cross-heads in the case of an outside valve-gear

Each driving-wheel should have sufficient weight added to counterbalance the weight of its revolving parts including the crank-pin, crank-pin nut, and the proportion of the weight of the side-rods attached to the crank-pin. The main driving-wheel should have added one-half the weight of the main rod, and two-thirds of the weight of the eccentric-arm for outside valve-gear

The amount of overbalance which is used to counteract the desired portion of the weight of the reciprocating parts should be distributed as nearly as possible among all driving-wheels, adding to it the weight of the revolving parts for each wheel, this sum for each wheel, if placed at a distance from the driving-wheel center equal to the length of the crank, or a proportionally less weight if it is a greater distance, will be the counterbalance required

In calculating centrifugal and reciprocating forces they are usually estimated at a speed in miles per hour equal to the diameter of the driving wheel in inches. This is generally referred to as diameter speed



DOUBLE-ENDED FAIRLIE LOCOMOTIVES ARE POPULAR IN COUNTRIES WHERE HEAVY GRADIENTS HAVE TO BE WORKED, BUT THEY HAVE NEVER MET WITH FAVOR HERE. THE ONE SHOWN ABOVE IS OF THE STANDARD GAGE TYPE USED BY THE NITRATE RAILWAYS COMPANY OF CHILE

At this speed the reciprocating parts, due to the laws of inertia, tend to continue their motion at the end of each stroke with a force about equal to forty times their weight. The overbalance also exerts a centrifugal force equal to about forty times its weight, and is at a maximum at the top and bottom position of the crank.

This force is added to the static weight in the lower position of the overbalance, and is opposed to this weight in the upper position.

Approximately one-fortieth of the static weight on a wheel will, therefore, give the weight of the reciprocating parts which could be balanced without causing the wheel to rise from the track at diameter speed. This amount of balance would also double the load on the rail when the balance is down.

It should be remembered that this dynamic augment varies with the length of the stroke.

For example, if the overbalance or excess weight at one half of a stroke of 18 inches, the dynamic augment at a diameter speed will be 29 times the weight.

With 24 inches stroke, the augment at diameter speed will be 28 5 multiplied by the weight. With a 30-inch stroke, the augment will be 48 2 times the weight, and so on with an equally increasing ratio all through.

The general practise in counterbalancing locomotives is to balance a portion of the total weight of reciprocating parts, usually about two-thirds. Counterbalances at their best are only a compromise figure.

CROSS-COUNTERBALANCING.

2. In American counterbalance practise each side of the locomotive is considered separately; but in Europe the practise of what is known as cross-counterbalancing is quite common. It can be readily imagined that the counterweights, being attached to the wheels on the same axle, has a disturbing effect on the opposing sides.

This disturbance, caused by the parts revolving in different planes, is partially overcome by placing the counterweights at some point varying from the line passing through the exact center of the crank-pin.

This was the case in connection with the Italian locomotive pictured on page 633 of the August, 1917, issue of the RAILROAD MAN'S MAGAZINE, and which brought inquiries from G. M. G., Ceres, California, yourself, and others, as to what was the matter with the locomotive. In the picture referred to, the counterweight on the main driving-wheel is in advance of the counterweights on the other wheels.

RAILWAY REGIMENTS.

M. E. H., Augusta, Georgia.—Quite a number of railroad men who enlisted for service since the outbreak of the war are corresponding to these columns relative to the chances of their being transferred from their present locations to the railway regiments that have since been organized.

We do not think that there is much chance for such transfers. As fast as a call was issued for skilled railroad men the various regiments were almost immediately recruited to full strength.

In addition to the nine regiments of railway engineers now in France, at the time this is written, two additional regiments composed of railway men are being organized at Camp Grant, Rockford, Illinois, and are about ready for service.

These are the Twenty-First Engineers, for light railway construction and operation, commanded by Colonel Ernest D. Peck, and the Thirty-Fifth Engineers, a shop regiment, commanded by Colonel A. E. Waldron.

RAILROAD MEN AND THE DRAFT.

W. L., Schenectady, New York.—At the time the act was passed conscripting men between the ages of 21 and 31 years for military service, provision was not made exempting railroad brakemen or any other class of men for such service.

EIGHT-HOUR LAW.

P. G. L., Norfolk, Virginia.—See our answer to J. C. R., Haskell, New Jersey, on page 612 of the December, 1917, issue. It is our opinion that the eight hour law was intended to cover such a line as you mention, but in the variance of opinion between the railroad officers and the brotherhoods, it would be hardly fair to expect us to decide the question. It is a matter that will probably be dealt with through the courts, and until some decision is arrived at we cannot render opinions on individual cases.

U. S. RAILROADERS IN RUSSIA.

J. A. S., Savannah, Georgia.—In the November issue of the RAILROAD MAN'S MAGAZINE, under the heading of "Frogs," appeared the information that United States railroad men were required for service in Russia. A number of readers have written to us offering their services for the Russian Railway Service Corps.

This corps was recruited under the direction of Mr. S. M. Felton, director-general of the railways, Washington, District of Columbia. However, the personnel for this corps, which was recruited primarily for the operation and maintenance of the Trans-Siberian Railway, was completed in November, 1917, and, of course, there are no openings at the time this answer is written.

In addition to the commissioned officers of the higher ranks, who are recruited from former railroad operating and mechanical officers, the expedition also includes 24 traveling engineers, 24 trainmasters, 12 chief despatchers, six boiler foremen, and one secretary to general manager, all with the rank of first lieutenant; two secretaries to general superintendent, one secretary to superintendent of motive-power, 60 train despatchers, 3 line repairers, 1 lineman, 20 roundhouse foremen, 2 machine foremen, 3 engine erecting fore-

men, 4 boiler foremen, and 1 foundry foreman, with the rank of second lieutenants.

THE WALSCHAERT GEAR.

D. W. B., Lake Helen, Florida.—The Walschaert locomotive valve-gear was the invention of Mr Egide Walschaert, a young Belgian engineer, who first applied his variable expansion valve-motion to a locomotive at Brussels, Belgium, September 2, 1848.

INVENTION OF THE INJECTOR.

2. The boiler-feed injector was invented about 1852 by Henri Giffard, an eminent French scientist and aeronaut. Giffard was one of the first aeronauts to construct what he proposed would be a dirigible balloon, which was a spindle-shaped vessel 144 feet long. It was in connection with this balloon that he invented the injector that was intended to be part of a very light steam engine.

The balloon did not meet with the expectations of the inventor, and the injector was laid aside and almost forgotten. During a sea voyage Giffard happened to meet Stewart, of the engineering company, Sharp, Stewart and Company, Manchester, England

In the course of a conversation on boiler feeders, Giffard remembered his injector, and described its method of action. Stewart was struck with the simplicity of the device, and, as his company were locomotive builders, he concluded that the injector would make an admirable boiler feeder for locomotives.

He undertook to introduce the injector in the British Isles, and his company acted as general agents for its sale. By their advice William Sellers and Company, Philadelphia, were given control of the American patents, and their wide connection with railroad companies served to introduce it under the most favorable auspices

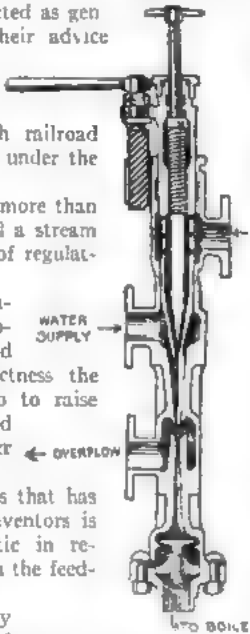
The Giffard injector was little more than a syringe or squirt that projected a stream of water with very little means of regulating the flow.

The problems solved by the improvers of the injector was producing an instrument that could be regulated to feed with exactness the quantity of water required, also to raise the water from a lower level, and to make the injector feed water of moderately high temperature

Another peculiarity of injectors that has received much attention from inventors is making the instrument automatic in restarting itself when for any reason the feed-flow has been interrupted.

William Sellers and Company have introduced several forms of injectors since they began making improvements on the Giffard. The self-acting injector was brought out by them as early as 1864, and the improvements and latter adaptations of the principles involved have been such that the injectors of to-day are as nearly perfect as human ingenuity and continued experiments can approach perfection.

We could not publish full descriptions with illustrations of all the valve-motions in use. It is likely that these may be made the subject of special articles in early issues of the RAILROAD MAN'S MAGAZINE.



SHOWING PRINCIPLE OF THE MODERN INJECTOR

LOCOMOTIVE CLASSIFICATION.

D. W. M., Grand Rapids, Wisconsin.—Nearly all railway companies have their own method of locomotive classification. Instead of the more common method of designating locomotive classes by names, such as Atlantic, Pacific, Mikado, *et cetera*, in the majority of instances the classes are designated by initials, such as A, B, C, and so on.

Very often this classification initial is stenciled on the cab of the engine to indicate readily to what class it belongs. For instance, in the case of the Chicago, Milwaukee and St. Paul engine with G6 'S stenciled on the cab.

With this road's method, G indicates that the engine is of the 10-wheel simple type. The figure 6 represents subdivision of this class, due to variances in design, and the S indicates that the engine is equipped with superheater.

The full classification scheme of the Chicago, Milwaukee and St. Paul was given in our answer on page 294 of the February, 1917, issue of the RAILROAD MAN'S MAGAZINE.

The information given in the last paragraph of our answer to J. E. A., Reading, Massachusetts, answers your other questions.

A. H. SMITH.

G. T. M., Peterboro, Ontario. No, we do not believe that Mr. A. H. Smith, president of the New York Central, is the party you think he is.

Mr Smith's railroad career was as follows

Previous to October, 1890, was foreman of bridges, Lake Shore and Michigan Southern Railway; October, 1890, to October, 1891, superintendent, Kalamazoo Division; October, 1891, to February, 1893, superintendent, Lansing Division; February, 1893, to July, 1897, superintendent, Franklin Division at Youngstown, Ohio; July, 1897, to April 1, 1901, superintendent, Michigan Division at Toledo, Ohio; April 1 to June 17, 1901, assistant general superintendent, Lake Shore and Michigan Southern Railway at Cleveland, Ohio; June 17, 1901, to February, 1902, general superin-

tendent, same road, February, 1902, to July 1, 1903, general superintendent, New York Central and Hudson River; July 1, 1903, to April 15, 1912, general manager, same road; June, 1906, to April 15, 1912, also vice-president, same road; April 15, 1912, to March, 1913, vice-president, New York Central lines east and west of Buffalo; March, 1913, senior vice-president, same lines, and at the present time he is president of the system.

AGE LIMIT AGAIN.

L. E. W., Humboldt, Arizona. See our answer to H. A. H., Oelwein, Iowa, elsewhere in this department of this issue. As we cannot give a complete list of the roads that have raised their age limit, with your previous experience as a railroader you should have no hesitancy in making application to any of the roads, especially to the larger systems, where the shortage, especially of skilled labor, is acute.

RAILROAD SERVICE.

L. M. S., Camp Wheeler, Georgia.—Your question is one of those that is asked us from time to time, and on which we cannot be of much real service to the individual correspondents.

What branch and what kind of railroad service would we advise young men to enter would be difficult to answer unless we were intimately acquainted with each man that asks the question, and it is very doubtful if our advice would even then be of any real value.

It is entirely a question of the man, as there is not a single branch of railroad service that does not offer unlimited opportunities for advancement.

CORRESPONDENCE SCHOOLS.

H. M. R., Stockton, California.—We cannot render opinions as to the relative merits of courses offered by various correspondence schools.

Of course, there are a number of such schools of long establishment and recognized reputation that may well be depended upon to fulfil the object of better education of men in the direction covered by their various courses. Then there are others on which we do not care to pass judgment.

Not long ago we were in communication with a lady who had put a question of this kind up to a large number of railway officers of western roads, and she informed us that the officials referred to did not know the duties covered by the course of study offered by one school, at least, not under the title at which it was being offered to the public.

STUDY COURSE.

G. R., Collingwood, Ontario.—What we have said above in answer to H. M. R., Stockton, California, applies equally to your question, with this difference: The man that founded and prepared the papers of instruction for the institution to which you refer is unquestionably a man of real ability.

We know that for about thirty odd years he has been employed from time to time to organize for some of the largest railroad systems schools of instruction for men in that branch of railway work in which the institution with which he is connected offers courses of study. We are quite familiar with their papers, and know they are good, and of real value to any young man seeking employment in that branch of railway work.

As to their broad guarantee relative to securing employment we do not know, and will not render opinion. So far as the course of study is concerned we are quite sure of its value.

RAILROAD MEN FOR RUSSIA.

F. S., Portola, California, and others.—The answer to J. A. S., Savannah, Georgia, elsewhere in this department of the present issue gives the information you wish.

BOX-CAR CAPACITY.

H. S. B., Renovo, Pennsylvania.—There is undoubtedly a tendency to load cars in excess of their marked capacity, or in violation of other rulings, in the case of certain commodities. Last year the Intercolonial Railway of Canada bought one thousand box cars for use on that road, and the interior was stenciled showing the heights to which certain grain commodities could or should be loaded, the name of each commodity being indicated. The object, was, of course, to prevent excess loading in the case of certain grains.

RAILROAD BOOKS.

K. R., Newark, New Jersey.—"Valve Setter's Guide" may be obtained from the Railroad Book Supply Company, 838 Columbus Avenue, New York City. The price is fifty cents. The same company will furnish you with books on the air-brake.

STEEL TIES.

J. J. G., Highland Falls, New York.—Steel railway ties are used very extensively in other countries than the United States with highly satisfactory results. For instance, in Germany fully 40 per cent of the railway-track is laid with steel ties. As yet they have not made any appreciable progress in this country, due to the hitherto abundance of good, cheap timber.

The most extensive use of the steel tie in the United States is on the Bessemer and Lake Erie Railway, where several hundred thousand are in use in main track.

In regard to your other question, where track-circuits are used for automatic signaling, the use of steel ties requires that insulating plates must be placed under the rails and suitable insulating washers and sleeves on the bolts. On the Bessemer and Lake Erie installations, ¼-inch fiber tie-plates are used under the rail and a fiber bushing is placed between the bolts and clamps.

Telegraphic & Telephonic

IF there is anything you want to know about the telegraph, telephone, or radio telegraphy—if you have an operating problem that puzzles you—if you want to discuss a question of theory—write the RAILROAD MAN'S MAGAZINE. We have engaged a technical expert who is one of the leading authorities of the country on these subjects. Ask him. He knows!

RADIO TO MORSE.

H. W M., Santo Domingo.—We are glad to know that radio operators located at stations widely scattered throughout the seven seas like the RAILROAD MAN'S MAGAZINE, and that our Telegraph and Telephone Department is attracting their attention. It is our desire and aim to emphasize the fact that Morse telegraphers, both railroad and commercial; radio operators, and telephone electricians all are engaged in a common field of endeavor, and if we can succeed in developing bonds of fellowship between the thousands of men engaged in these various branches of the art of transmitting intelligence we shall be happy.

In the United States at the present time there is a growing shortage of Morse telegraphers, and the salaries paid by commercial telegraph companies and by the railroads are higher than they have ever before been.

The shortage is due to an enormous increase in the volume of business being placed upon the wires, and to enlistment in the national forces of many telegraphers, many of whom will obtain advanced rank and remain in the military establishment

It seems to us that you are agreeably and comfortably situated where you are now—winter is coming on and we are thinking of palm trees and coconuts—but should you later on return to the States, you might get in touch with us at that time, and very likely we can give you advice as to the best place to look for an opening.

GERMAN WIRELESS.

GEORGE W., Los Angeles, California.—The German transatlantic steamship Imperator had three different radio outfits, each having its own aerial. The power equipment consisted of a motor-generator furnishing 500-cycle current at 1,600 r. p. m., the motor current being supplied by the ship's lighting generator.

The aerial used for the high-power set was of the T type, 670 feet long, supported between the masts at a height of 240 feet. With this set communication could at all times be maintained with both Europe and America. Operation could be maintained on wave-lengths varying from 300 to 5,000 meters.

The second set had a daylight range of 350 miles and a night range of 700 miles. A motor-generator supplied current to a 1½ k. w. transformer. This set was equivalent to those carried on British and American liners.

The third set was the auxiliary, employing an induction coil and storage-battery power. The two latter sets had individual single wire aerials strung between the radio-cabin and one of the masts.

FIFTY WORDS PER MINUTE.

M. M. L., Kansas City, Missouri.—Copying fifty words per minute with a typewriter is as easy as rolling off a log, if the Morse sending is good, plain stuff The phonograph Morse record No. 11-12 contains straight matter which was recorded, by a tournament winner, at fifty words per minute. By speeding up the phonograph to its highest speed the reproduced signals are sent at the rate of fifty words per minute, and, being perfect Morse, sound more like thirty words per minute

The Railroad Book Supply Company, can furnish you one of these records for $1.25. Their address is 838 Columbus Avenue, New York City.

PHONE DESPATCHING.

HOP PHILLIPS, New Haven, Connecticut.—Most railroads in the United States are using the telephone for train-despatching purposes over certain sections of their lines. There are, however, about thirty thousand more miles operated by telegraph than by telephone. The lines using the telephone to a greater extent than the telegraph are Santa Fe, Seaboard Air Line, Chesapeake and Ohio, and Louisville and Nashville. Other lines using the telephone on about half their mileage are C., B. and Q.; C., R. I and P., Illinois Central, and St. L. and S. F.

In Canada, the Canadian Pacific, Grand Trunk, and Canadian Government Railways use the telephone on certain sections

In regard to the Prince Edward Island Railway, the road is comparatively short—Charlottetown to Tignish, 116 miles, and Charlottetown to Elmira, 75 miles. You might communicate with Mr H McEwen, superintendent, P. E. I. Ry. Co., Char-

lottetown, P. E. I., in regard to the present conditions of employment

The Long Island Railroad has one line from New York to Greenport, 96 miles, and the shore line, New York to Montauk, 118 miles. Mr L S Wells is superintendent of telegraph, Pennsylvania Depot, New York City

The New York subway lines, and the elevated lines throughout Greater New York, do not now use the telegraph to any great extent On the Third Avenue Elevated you may notice that at the express stations the old reliable box-relay is still on duty; used, perhaps, only when the telephone is out of commission or when accuracy is demanded

HERTZIAN WAVES AND LIGHT RAYS.

W. R. K, Providence, Rhode Island.—Your question—"Why do Hertzian waves employed in radio-telegraphy pass through stone walls, while light-rays do not?"—is one which is at the present time puzzling a great many students of radio-telegraphy.

An explanation is that light-waves, or rays, will not pass through solids because these rays are of a length about the same as the spaces between the atoms of solids. Hertzian waves pass through because in length they are much greater than the spaces existing between the atoms of solids.

In solids, the space between the atoms is approximately one hundred millionth of an inch. Light-rays are of about this same length

X-rays pass through solids because they are much shorter than the space between the atoms of solids

The length of these waves may be determined by dividing their velocity by the number of their vibrations per second Hertzian waves and light-rays travel at approximately the same speed, 186,000 miles per second

The vibration frequency of Hertzian rays is approximately 230 millions per second The vibration frequency of light-rays ranges from 400 billions to 750 billions per second. Different vibration frequencies produce different colors—450 billions, red; and then in order, orange, yellow, green, blue, indigo, and violet, the latter color being produced by vibrations having a frequency of 750 billions per second

In order to learn how these waves pass through solids let us imagine that in a lake fifteen feet deep we set up twenty rows of 20-foot stakes, the stakes in each row being two feet apart, and the rows two feet apart.

Surface water-waves about two feet from crest to crest rolling against this barricade of stakes will be broken up before they have gone through more than three or four of the rows of stakes, and the surface of the water beyond the barricade will be unaffected. This illustrates the breaking up of light-rays before they have penetrated far into solids

Now imagine that great breakers come along, having between crest and crest a length of sixty feet; these waves will pass through the stakes almost without interference, and the surface of the water beyond the barricade will show the waves traveling serenely on, still sixty feet in length. In a similar manner Hertzian waves, which may be miles in length, pass through stone walls without being materially retarded

Suppose now that the stakes be set so that the distance between them is several thousand feet instead of two feet. The short waves will pass

TWO SECTIONS OF A MAIN OFFICE SWITCHBOARD. THE PORTIONS OF THE BOARD SHOWN ACCOMMODATE FOUR HUNDRED TELEGRAPH TRUNK WIRES

through them and reach the water beyond the barrier practically without interference. This illustrates the action of X-rays passing through solids.

SIGNAL CORPS MORSE.

WILLIAM H., Escanaba, Michigan.—The American Morse code is used officially by the United States army in the operation of land telegraph lines, short cables, and field telegraph lines.

The Continental code—known in the Army as the General Service Code—is used for communication between units of the navy and units of the army; also in army and navy radio work, on submarine cables using siphon recorders, and with the heliograph, flash-lanterns, and all signaling apparatus using the wig-wag.

COSTON AND VERY SIGNALS.

G. L. K., Detroit, Michigan.—In the February issue of this magazine we gave an account of the origin of these two systems of signaling, both of which are used by the United States military.

The Coston lights are made of a slow-burning composition, and when used in signaling are placed in specially designed holding sockets and displayed by hand.

The Very system is used by the navy to transmit flag-code signals listed in the "Battle or General Signal Book." These signals are fired by a breech-loading, single-shot pistol with an eight-inch barrel.

The shell used is a brass No. 12 gage shotgun type, which when fired projects the "star" signal to a height of 200 feet for use in night signaling. The day signal consists of streamers of smoke. The night range is several miles, and the day range about one mile.

TELEGRAPHY IN GERMANY.

WILLIAM McD., Pittsburgh, Pennsylvania.—For German telegraphs, the last figures available are for the year ending December, 1908. At that time there were in the German Empire 41,394 telegraph stations and 33,541 cities or towns with telephone connection. The total miles of telephone and telegraph pole lines was 202,000; the wire mileage, 3,200,000.

In the year 1908 were transmitted 54,008,541 telegrams, and 1,519,370,970 telephone messages (conversations).

The telegraph and telephone receipts (omitting Bavaria and Wurttemberg) were $36,250,000, for 1908.

In the empire there were about fifty wires operated duplex by means of the Hughes printing-telegraph system; 178 circuits were operated as joint telegraph and telephones lines.

In addition to the English Hughes printer system, the Germans make extensive use of the French Baudot high-speed automatic-telegraph system, the English Murray printing telegraph, and the English Wheatstone high-speed telegraph system.

MORSE KEY FOR DESK PHONE.

G. K. L., Wheeling, West Virginia.—There is a special type of Morse key which may be mounted upon the upright stock of a desk-set telephone for use in telegraphing over telephone lines. The instrument is of value chiefly where two telegraphers are conversing by telephone, and desire to confirm doubtful words by means of spelled-out dot-and-dash signals.

No extra electrical connections are necessary. Operating the key produces sounds which affect the telephone transmitter, and thus are transmitted over the telephone line to the distant telephone receiver. The instrument costs three dollars, and may be purchased from Paul D. Banholzer, 2339 East Huntingdon Street, Philadelphia, Pennsylvania.

WOMEN OPERATORS IN R. R. SERVICE.

L. M. Q., Antigo, Wisconsin.—Practically all American railroads are at the present time placing women telegraphers in offices along their lines. In most cases the salaries paid are the same as to men.

There are, of course, many telegraph positions which woman cannot fill as satisfactorily as men, such as points where the telegrapher is required to attend to heavy station duties, operate switch and semaphore levers, work nights at lonely junction stations, *et cetera*.

By applying to the manager of the Western Union Telegraph Company at Antigo you could very likely secure an opportunity to learn telegraphy, or you might communicate with Mr. J. J. Ross, superintendent of telegraph, Michigan Central Railroad Company, Detroit, Michigan, asking if an opportunity can be given you to learn telegraphy at some station on that road.

RADIO SERVICE.

G. L. C., San Francisco, California.—Replying to your questions in the order submitted:

1. Yes, there are several schools for teaching radio on the Pacific coast. Communicate with superintendent, Marconi Wireless Telegraph Company, San Francisco.

2. A good book is "Practical Wireless Telegraphy," by E. E. Bucher. The price is $1 60, and it may be purchased from the Railroad Book Supply Company, 838 Columbus Avenue, New York City.

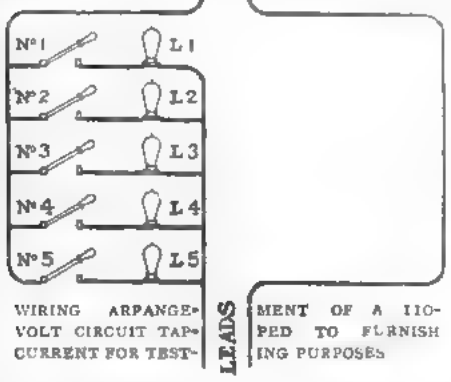
3. The average pay for first-class radio operators at shore stations is one hundred dollars per month; on ships about fifty dollars per month, including cabin and board. At the present time most of these positions are controlled by the government.

4. The Phillips Code is used to a greater or less

extent by good radio operators, especially in the handling of press matter and in conversation

110-VOLT TEST CIRCUIT.

ARTHUR W. H., Newark, New Jersey.—When a 110-volt electric lighting or motor circuit, either a. c. or d. c., is tapped to furnish current for testing purposes, it may be so arranged that the current (testing wires) will vary in strength from ½ ampere to 2½ amperes, or from



WIRING ARRANGEMENT OF A 110-VOLT CIRCUIT TAPPED TO FURNISH CURRENT FOR TESTING PURPOSES

1 ampere ranging all the way up to five amperes as desired.

The diagram herewith submitted shows the wiring arrangement. If it is desired to vary the current from ½ ampere to 2½ amperes, lamp 1, lamp 2, lamp 3, lamp 4, and lamp 5 may be ordinary 16-c. p. carbon lamps. If the variation is to range from 1 ampere to 5 amperes, the lamps may be 32-c. p. carbon lamps.

Closing switch No. 1 permits ½ ampere to flow through the lead circuit (when 16-c. p. lamps are used). Closing switches No. 1 and No. 2 permits 1 ampere to flow; and so on, as each switch is closed the current strength is increased ½ ampere.

Obviously ten or twenty lamps may be connected in the same manner instead of five, as shown, and the current strength varied within any limits desired

The fuses F should be of the plug type, and a supply of plug fuses varying in capacity from 5 amperes upward — depending upon maximum strength of current flowing—should be kept on hand.

SECOND SIDE OF QUAD.

H. L. K., Salt Lake City, Utah.—It is perhaps true that to-day there are not as many satisfactory second-side quad circuits in operation as were used twenty years ago. The reason for this is that the increasing use of the vibroplex transmitter on the polar side as well as on the second side results in line currents being less stable, with a consequent reduction of average current values in relay coils.

Good hand-senders still can operate quad second sides as efficiently as ever, and there are some users of vibrotransmitters who can closely imitate hand-sending.

Among the many satisfactory quad second sides now in use might be mentioned the W. U., Kansas City, Wichita local. The operators who work this circuit—C. A. Pace and E. J. Jones—have an average of ninety messages per hour each There surely is nothing the matter with this second side.

OPERATORS WITH THE COLORS.

THE following-named railroad telegraphers have joined units of the national military or naval forces:

N. Y., N. H. and H.—C. C. Carey, W. F. Lyman, Henry A. Quinton, E. H. Beaudet, C H. Lyons, Eddie McMahon, and Mr. Fanning.

C., St. P., M. and O.—F. White and D. F. J. Payson.

Union Pacific.—J. Q. Fulbright, W B. Evans, C. W Johnson, L. T. Killon, L. C. Jones, C. G. Osborne, and Messrs. Seat and Mierotto.

New York Central—R. C. LaBarr, A. L. Blackwell, Carl Hoover, G. J. Rougex, J. T. McGonigal, A. M. Kerin, R. S. McGonigal, G. E. McGonigal.

Norfolk and Western.—S. M Foster and L. W. Bowden

Atlantic Coast Line.—H. A. Owen, E. B. Collins, C. C. Dempsey, and Messrs. Lambert, McGahagen, Ramie, and Corrie.

Michigan Central.—William Ausum, Glen Gould, G. Patton, A. Hubbard, and Messrs. Talley, Moon, and Siefried.

Nickel Plate.—L. M. Walker, G. Kerragher, and V. M. Kelly.

C., M. and St. P.—Slim Dahioux, Emory Elliott, and Messrs. Klugh, Findlay, Magett, Tyro, White, and King

C. and E. I.—C. E. Virden and J. E. Kennedy.

Southern Pacific.—V. L. Gentry, J. F. Collins, J. R. Timmers, W. B. Seger, and Messrs Williams, McCarger, and Allard

Northern Pacific.—R. L. Wilson, W. J. Lucksinger, F. A. Miller, J. D. Rohrere, and Messrs. Davis, Russell, Parks, Jones, and Tollefson

Queen and Crescent.—Mason Caldwell, M. W. Caldwell, and Messrs. Cash and Boyd

C. and N. W.—R. E. Grilley, W. J. Hibbard, R. J. Main, E. M. Richards, C. J. Calhoun, Tom Carroll, W. F. Swanson, A. J. St. Onge, and Messrs. Pickard and Sofholm.

BOOK REVIEW.

ALTHOUGH in the preface of this new work on radio the author states that no attempt has been made to treat the subject with rigid scientific accuracy or completeness, a reading of the book shows that writers of literature dealing with radio telegraphy are gradually learning what writers of books dealing with land-line telegraphy and cable signaling learned twenty years ago—that descriptions of theory and of practise must be presented in every-day language; that wiring

diagrams must be uniform and not difficult to trace.

The reason for the very limited sale of books heretofore written on radio telegraphy was mainly that the authors were amateurs unfamiliar with conditions of telegraph operation and traffic, or were theorists of the "pure science" order, who were able to turn out matter of value only in the laboratory or class-room.

Mr. Bucher has succeeded in producing a work that is of value to the amateur experimenter, the student, and the practical radio telegrapher. The chapters dealing with elementary electricity and magnetism are well written and well illustrated; as also are the chapters on motor generators and storage batteries.

Everything relating to the modern practise of radio telegraphy is treated systematically and clearly, and undoubtedly the work will find its way into the hands of all who are seeking light upon this very interesting subject.

In writing his book, the author has been somewhat handicapped by being in the service of the Marconi Company, as evidently he has not been privileged to call some of the radio devices in use by their commonly accepted names. Dr Lee De Forest's marvelous audion, for instance, although well covered by diagram and text, is referred to as the "vacuum valve."

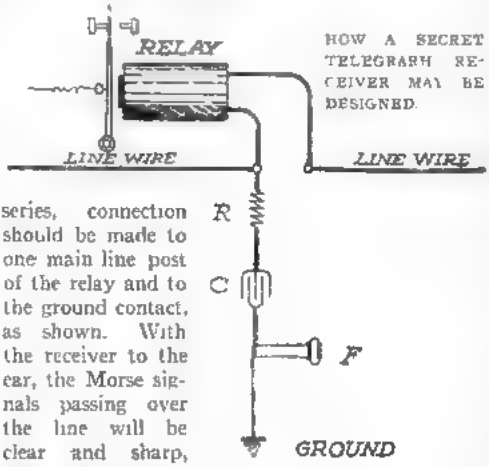
PRACTICAL WIRELESS TELEGRAPHY.—By Elmer E. Bucher. Cloth bound, 6¼ x 9½ inches; first edition; 322 pages; 323 illustrations. Published by the Wireless Press, Inc., New York City. $1.50 net.

SECRET SOUNDERS.

W. B. W., Butte, Montana.—There is on the market a secret sounder which is made up as a headband telephone receiver, the usual telephone diaphragm and magnets being replaced within the casing by a miniature sounder. The instrument complete costs six dollars.

A satisfactory secret telegraph receiver may be made up as illustrated theoretically in the accompanying diagram. R is a resistance unit which may be any coil or coils of about 100 ohms total resistance. C is a condenser of one-tenth to one-half microfarad capacity; a small tin-case telephone type of condenser will do. F is an ordinary telephone receiver.

When these instruments have been connected in series, connection should be made to one main line post of the relay and to the ground contact, as shown. With the receiver to the ear, the Morse signals passing over the line will be clear and sharp, but cannot be heard by others in the room where the receiving operator is working.



HOW A SECRET TELEGRAPH RECEIVER MAY BE DESIGNED.

The regular sounder should be silenced by opening the local circuit or by screwing tight the sounder armature.

It might be as well to add that inasmuch as this device is of common knowledge, the publication of a description of it is revealing nothing to the enemy.

EVERYTHING IS UP BUT THE FREIGHT RATES.

"WHEN you hand a newsboy a nickel for a morning newspaper," says R. J. Clancy, assistant to general manager of the Southern Pacific, "you have spent almost twice as much as the railroad receives for transporting a delicious cantaloup and a sun-kissed orange from the fields and groves of California to the breakfast-tables of New York.

"It costs more to send a letter through the mails from New York to San Francisco than to ship a five-dollar hat the same distance by freight.

"At some factory in the East that pair of shoes you are wearing, and which has doubled in price, was loaded into a car and hauled three thousand miles to the Pacific coast for one-third of what your barber would charge you for a shave.

"That suit of clothes you have on was hauled in freight-trains one-eighth of the distance around the world at a total cost of about nineteen cents.

"If living in San Francisco, Oakland, or any other Bay point, you would have to eat four Petaluma eggs every day for two months before the cost of transportation thereof would equal the price of a two-cent postage stamp.

"A pound of live beef from Nevada is hauled more than three hundred miles to San Francisco over a mountain range a mile and a half high, and lowered a mile and a half to sea level, for about one-third of a cent.

"In view of these facts, do you wonder that, burdened by increased wages, increased taxes, increased cost of capital, and increases of from one hundred to five hundred per cent in the cost of fuel oil, material, and supplies, the railroads sought relief through the medium of a fifteen per cent increase in rates?

"And did you ever stop to compute or consider how much such increase would amount to? Well, on a thirty-five-dollar suit of clothes, five-dollar hat, eight-dollar pair of shoes, thirty dozen eggs, and seven pounds of live beef, shipped respectively from New York, Petaluma, and Wabuska to San Francisco, the total fifteen per cent increase would amount to less than five cents."

THE RAILROADESS.

BY C. W. DURR.

THE time has come to change our tune
And sing a different lay;
Things that mother took pride in
Do not exist to-day.
The mode of yesterday is gone,
A new régime is here;
The women now are doing work
From which one time they'd veer.
But—there's a reason.

Who ever thought that Sister Jane,
So dainty, petite, grand;
Would guard a railroad crossing,
With her gizzard full of sand?
Who ever thought to see the day
When girls would sort the scraps,
From old and broken rolling-stock,
Like ordinary chaps?
But—there's a reason.

Who ever thought that girls would stand
Behind the coffer wicket,
And blithely sell to all that come,
A brand new railroad ticket;
Or trace a shipment long delayed;
Or calm a raving shipper?
But this is done now every day,
By those who wear the slipper.
But—there's a reason.

The *reason* is our country's flag,
For brave men has been pleading;
To shoulder arms, to fight the Hun!
And o'er the seas they're speeding.
The work they've left, it *must* go on;
Their jobs the girls are filling;
They cannot fight, but in this way,
They show their spirit's willing.
Three cheers for the railroadess.

HUNS WREAK HAVOC ON R. R. STATIONS.

ALL THAT REMAINED OF THE DEPOT AT NIEUPORT LES BAINS AFTER THE TEUTON HORDES HAD CEASED THEIR GUNFIRE. SOME OF THE FIERCEST FIGHTING OF THE WAR OCCURRED HERE

DESTRUCTION WROUGHT AT THE HALIFAX RAILROAD TERMINAL WHEN, AS THE RESULT OF THE FEARFUL EXPLOSION, THE STATION ROOF FELL, KILLING SIXTY PERSONS.

Photos copyrighted by Underwood and Underwood

HOW WE ARE DOING "OUR BIT."

BY CHARLES BURLINGAME,

Railroad Superintendent, St. Louis, Missouri.

I AM working as I never worked before for every feature of transportation efficiency met with in crowded railroad terminals, mainly as follows:

To keep my organization intact, by personally talking to every man calling for his time and appealing to his pride and patriotism, also helping him over his difficulties, being sure that transportation is as important to the success of the war as men, money, and munitions.

To have men see the same truth I see, and to realize how serious is the mission of the United States in the present world cataclysm, which has developed into a work to make men free.

By driving home to the men on our engines, in our yards and in our offices, who are as important at their posts in this emergency as the men in the trenches, that the success of the war largely depends upon transportation and transporting soldiers.

To hurry completion of authorized new facilities, so necessary to increase the car-handling in this supreme test of our works.

To keep bills and cars traveling together, thereby saving back-hauls against the current of traffic, and striving to keep the flow business moving with as few interruptions as possible in the direction of destination.

Working with my assistants and the general chairmen of the railroad brotherhoods to keep the fully qualified and trained-to our service men working more regularly, thereby greatly enhancing our efficiency.

Appealing to the patriotism of the men instead of administering reprimands and suspensions, knowing full well that the word "patriotism" has a peculiarly inspiring ring in it for the railroad men, who are among the bravest and made of the stuff which makes heroes.

Making a special effort to crowd two cars through where one previously moved in times of peace.

Cooperating with superintendents of neighboring lines, making unusual and through moves, gaining help while giving it, thus merging our individual efficiency into an efficiency which does the most for the railroads as a whole and for the government; ragingly optimistic of our ability at the St Louis gateway to keep up with war-time transportation necessity.

Eliminating seventy-five per cent of the special switches, to expedite the general movement; making no special switches except upon orders of the highest authority, thereby gaining immensely in the general handling of traffic.

Running cars, many of which before the war were transferred on technicalities, thereby increasing car-efficiency and avoiding yard congestions.

Making St. Louis and East St. Louis terminals of all the lines one big terminal in an effort to produce a maximum of transportation efficiency through this gateway.

WELLS, FARGO AS IT WAS IN 1855.

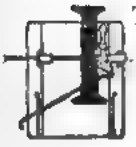
AT THE LATEST CALIFORNIA STATE FAIR THE OLD PLACERVILLE EXPRESS OFFICE WAS REPRODUCED FAITHFULLY. ALL THE ORIGINAL PICTURES, DUST-SCALES, SHOTGUNS, THE STOVE, AND TREASURE BOXES WERE TAKEN OUT AND PUT IN THE PLACES THEY OCCUPIED IN THE "FORTY NINE DAYS."

REPRESENTATIVES OF FOUR GENERATIONS OF THE WELLS FARGO COMPANY WHO PLAYED AN IMPORTANT PART IN THE UNIQUE EXHIBIT. FROM LEFT TO RIGHT THEY ARE: "HOLD THE FORT" AARON V. ROSS, GENERAL AGENT J. L. TUCKER, INDUSTRIAL AGENT TOM ELLIOTT, AND DRIVER H. L. COONS.

JONES ON THE CALL OF THE RAIL.

BY J. W. EARP.

The Rail May Chatter About the Old Farmstead, but You Couldn't Keep Him on It with a Ball and Chain.



IT was after supper hour when Jones strolled into the yard office. He glanced up at the extra board, then scowled and said:

"Ten times out! Can you beat it? Here I've lain around this one-horse town for two whole days, and I haven't turned a wheel. No wonder these guys take this job to have and to hold for life. They can't get enough to leave on."

"If half of what I heard about the investigation is true, you're lucky to have a job at all. They tell me the Old Man slipped you an awful package. Is that true?" And Doyle looked at the Boomer for confirmation.

The Boomer borrowed the "makings" from a switchman before replying. Then:

"Zowie! Kid, that was some investigation. But I sure got out lucky. I got my 'brownie' slip this morning to sign up. Guess how many I signed for."

"I haven't the least idea."

"Five," said Jones, with a grin.

"Get out!" almost yelled the men.

"Fact. I don't understand it at all. The clerk must have made a mistake some way or other. But I don't look a gift horse in the mouth. So I just signed up for the five and said nothing."

"Then you're not leaving us yet; eh, kid?" grinned the fireman from his seat on the bench.

"Me leave here?" Jones put the question sadly and shook his head. "Listen, partner; I expect to be here in this moth-eaten burg for many moons yet to come. And from the looks of my bank account and this extra board, I suppose I'll be one of the bunch to qualify for first place when the finals are run, and the paper will come out and say: 'He was one of the oldest inhabitants of our fair city.'

"Sure I make good money. But what are you going to do when you hold a pat straight from the go, and then some guy draws three cards and makes a flush? Did I go broke? Say! Even the cards laughed at me.

"You've got to hand it to that guy Knight when it comes to luck. If he was to fall into a lumber yard, he'd come out with a house and lot and a mortgage on the sawmill. He has horseshoes on both feet, rabbit hoofs in every pocket, and a lucky charm around his neck. As for me—"

"Three thousand tons!" yelled a voice that had in it a mixture of indignation and pained surprise.

Boomer Jones cut his narrative short and looked up to see who it was that would object to a little thing like three thousand tons. He saw "Dogface" Burley; then he heard him:

"Three thousand tons! You're crazy! Just because I'm getting a 'Mike' out of here is no reason why the whole kit and caboodle should go nutty. For goodness' sake, have a heart and tell the C. D. to cut off some of that."

"You'd holler if you had a caboose bounce," said the night yardmaster. "You'll find your train made up on track No. 3. Take 'em and get out of town, so I won't even hear the sound of your voice. You make me tired with your eternal beefing."

"All right, Ganes; all right! Hang 'em on while you can. 'Cause it may interest you to know that this is my last trip.

When I get back—good-by to the railroad game forever! The wife and I are going to the farm.

"No more chewing the rag with yard-masters; no more fighting all-night drags, no more trying to masticate restaurant fodder and sleeping in flea-ridden crummies; no more jacking-ups and calling-downs from the brass-collared gents with the ivory-domed skulls; no more chasing up and down this good-for-nothing pike with Uncle Sam's Federal law chewing the seat out of your pants, and the hogheads laying down on the job!

"No, sirree! I'm going so far away from a railroad that I won't be able to hear the whistle of an engine. I've got one hundred and sixty acres of the finest land you ever skinned an eye over, and you can go from one end of it to the other without throwing a switch or seeing an order-board."

Here Burley paused to take breath and bite off a chew from his plug before continuing. Jones only shook his head as Burley went on.

"After this trip the gay and festive farmer's life for Burley & Co. While you boys are slaving your lives out for a soulless corporation, I'll be watching Mother Nature pour money into my pockets, and my wife will be raising chickens and so forth. I'm quitting the railroad game for good. That's the kind of a man I am!

"There ain't no such animal," said Jones as he searched himself for a cigarette-paper while he eyed Burley curiously. "I've heard that line of talk ever since I first went railroading, and I never yet saw it work out according to schedule form. A railroad man may go to a farm, but he never stays there.

"Take my advice and take a one-year leave of absence. Before the time is up you'll be crazy to smell the smoke and cinders once more, and they couldn't keep you on a farm with a ball and chain. You can't learn how to railroad in a day or a year, and you can't drive it from the blood in a lifetime; it's there, and it won't come out.

"Better take a leave of absence and play safe. It's a safe bet—that is, if you quit—that in less than a year you'll be back begging the super for a job as engine-wiper, hostler, or any old kind of work where you can mix with human beings, hear cuss-words besides your own, and watch the wheels turn round."

"Never!" Burley snorted and shook his head. "I'm going to be one that went and stayed."

"Somebody slip me a little refined cabbage and an onion skin," said the Boomer; "I see I've got to argue with this gent."

Doyle was obliging, and as the Boomer worked he talked.

"I can sympathize with Dogface because I got the farm fever once myself. I guess we all get it sooner or later, only some get it worse than others. But, as for me, I'm cured forever."

Here the Boomer paused, borrowed a match, and continued the tale as soon as he had the cigarette burning to suit him.

"When I was on the C. E. and L., out of St. Louis, my Uncle John came to town on a visit. Uncle John was born and raised on a farm, and all he knew or wanted to know was farming, and all he'd talk was farming.

"By the time he got ready to leave he had me planting onions in my sleep and riding nightmares hitched to farm-wagons in my dreams. But he didn't help things any when he left, as his last words were:

"'Any time you want to quit railroading you come to the farm with your Uncle John; he'll make a man out of you.'

"The more I thought of it the better it sounded. So one day I pulled the pin on the job and blew to the little farm down in Missouri.

"Uncle John welcomed me with open arms. So did Aunt Bess. Help was scarce, and I went right to work.

"We got up at 4 A.M., milked six cows, curried three teams of horses, slopped the pigs, then turned the cream through the separator; all before breakfast. After breakfast it was work, work, work, until six bells, then do the chores again. If I got to bed by ten-thirty I figured I was lucky.

"One day I took a load of wood to town. It was the first time I'd seen town since I had been on the farm, and I will say it sure looked good to me.

"Just as I tie the horses to the hitch-rack in front of Eberhard's store, I hear a train whistle for town. Somehow that whistle just sent little thrills chasing up and down my spine, and my blood starts tingling.

"When the train whips through town I see she only has ten cars. Both shacks are out on top 'decorating' and highballing for all they're worth.

"All of a sudden I get homesick. I feel the call of the rail, and my feet get itchy to feel the crunch of the cinders, and my heart just aches for the sight of a round-house, while my hands get hungry to feel the bail of a lantern. Pardon the poetry.

"Right then I'd have given all I ever hope to have to have been on that train going West. But all I did was to swallow the lump in my throat and go into the store to see if Eberhard wanted to buy my load of wood. He did, and told me where to deliver it.

"Just as I got back from unloading the wood I see a drag heading into the passing-track. And by the time I had the groceries bought and put in the wagon, here comes the passenger-train, with smoke and cinders flying, and she jumps through the town like a whirlwind.

"When she disappears in the distance the drag gets under way. I just took one look at those moving cars, and then I made up my mind right quick as to what I was going to do. I wrapped the lines around the seat, jumped out of the wagon, and tore for the caboose.

"I squared myself with the rear shack, and he fixed it with the brains for me to ride. The horses went home by themselves, and I went to look for another job railroading.

"But no more shady dells, old oaken buckets, plowing corn, and farm-life for me! I've had my fill, and I'm through. It's fine to talk about, but it's hard to do!"

"The only time I ever come near a railroad will be when I am bringing pigs, cows, or produce to town," said Burley, shaking his head angrily.

"Pete Thompson had the bug worse than you have and he came back," retorted Jones, winking at Doyle. "He—"

There came a sound of cars crashing together; then the sound of a voice raised in angry protest:

"Confound you. Blankety-blank snakes anyway! Trying to kill us? Cut out the practising on this crummy and attend to your business.

Then another voice:

"Go back to sleep, you rhinoceros-hided tissue-snatcher! You're a bunch of nervous wrecks. You can hear a cat on a carpet three inches thick with the cat three blocks away."

Then a series of disjointed and only partly intelligible sentences that went something like this:

"I'll report you to the T. M., you—"

"You're imagination—"

"Imagination your eyebrow!"

"Don't you—"

"Now what in the—"

"Can't you guys—"

"Sure —"

"But—"

The rest died away as the engine and workers moved away. Doyle looked over at Jones.

"What was it about Pete Thompson?" he asked.

Jones saw that Burley was listening before he went on with the tale.

"Thompson was an engineer on the Santa Fe. He had the farm-bug bad. All the chatter you could get out of him was simple-life stuff and back-to-nature talk. Whenever he heard of a new piece of land he bought some. He had an orange-grove in Florida, a grape-arbor in California, and a wheat-ranch in Montana.

"One day he chucked the job and blew out to look his holdings over. He found he had the finest swamp in Florida, and enough alligators to stock up every amusement park in the world.

"His grape-arbor in California was about ten thousand feet above sea-level, and the land had snow on it the year around. For an ice plant it would have been great.

"And his wheat-ranch in Montana was one hundred and seventy-two of the finest hills you ever looked at; all sand and rock.

"Thompson was sure in the dumps when

he came back, but he never let on to us. He advertised his California land for sale, and an old farmer from Oklahoma bought it. When the deeds were being made out, Thompson slipped in the orange-grove tract and the wheat-ranch on to the poor old hick.

"Then Thompson bought a place in Oklahoma. He took on a one-eyed, balky mule, an old spring wagon, a few farm implements, a three-room shack and a wife, and settled down to be a cotton king

"The first year they had a failure. At the beginning of the second year he was so hard up he had to mortgage his farm and the coming cotton crop so as to be able to make both ends meet

"Along about the time the cotton began to get good there came a dry spell that lasted almost throughout the summer. Then came a heavy rain, mixed with hail, and the cotton shed everything except the mortgage.

"Pete takes one look at his gone crop; then he hitches up Bob, the one-eyed mule, and starts for town. He yells 'Get up!' to Bob, but Bob doesn't feel like getting up. Pete uses up all the remedies he knows of, but none of them work. He gets down off the wagon, walks around in front of Bob, looks him square in the one good eye, and says:

"'You long legged, misfit, hybrid son-of-a-jackass, are you going to move?"

"Bob doesn't answer, and Pete uses up his entire vocabulary of cuss-words without getting any rise out of Bob—mules are patient animals; you've got to give it to them. Pete picks up a fence-stake and says:

"'Once more, you lop-eared brute' Are you going to move?'

"Still nothing doing. It isn't moving day for Bob. Pete spits on his hands.

"'For the last time, you laughing hyena: will you move?' says Pete.

"Bobs yawns. Pete swings the fence-stake, and cracks Bob between the one good eye and where the other eye ought to be; Bob goes down like a beef. Pete turns his back on Bob, goes into the house, and begins throwing things into his suit-case.

"'What are you doing, honey?' says his wife.

"'Maria,' says Pete, 'throw your clothes together, pet; we are going back to civilization.'

"And they did. When they came out of the house, there they saw Bob making a streak of dust up the road. The reins are streaming out behind him, the wagon is seesawing back and forth across the road, and Bob is sure burning the wind. He didn't know where he was going, but he was on his way.

"Pete and his wife had to walk into town. Pete hocked his watch for tickets back to the Santa Fe. He's a passenger conductor on the Rock Island at present, and it 'd take seventeen general managers, twenty supers, forty trainmasters, and the entire United States army to get him away from a job railroading. If you want to fight, just mention farming to Thompson."

"Bugs!" said Burley.

But the crowd noticed that it was said in a half-hearted manner. Jones shook his head.

"That may be," he said. "But there's Jim Thompson, who owns all that land around Vera. Every time the local stops there to switch, he comes down to help. Told me he had made two thousand dollars off the farm last year, and expected to double that this year.

"Yet he's not satisfied. He told me he gets so homesick to railroad sometimes that he can hardly stand it. And he'll never be satisfied until he does; take it from me. Can you beat that case?"

"You don't like the farm, Jones; that's all."

"Every man to his place, Dogface—every man to his place. A railroad man is a railroad man; and you can't make anything else worth while out of him. The guys that have made a success outside of the railroad game were failures in it."

"I don't believe there's anybody that's crazy to railroad."

"That shows how much you know of human nature. There was Pat Maloney, section foreman, who had charge of Section No. 24. Pat had been working for the company for forty years; he'd been foreman for thirty.

"You know it used to be the Irish that

worked the section. I've seen the time when you couldn't go by a section gang and yell 'Pat!' without at least four of them looking up and saying 'What?' But they are all dead now, else they've been made foremen or roadmasters.

"Ever notice the names of the section foremen and roadmasters? If you ever do, just take a slant at the O'Briens, Murphys, Flannigans, O'Connells, O'Connors, Shaughnessys, Donovans, Doyles, Brannigans, Lannigans, and all the rest of them! But I was telling you about Pat Maloney.

"When Pat arrived at the age of seventy, though still hale and hearty, they pensioned him. But Pat wasn't going to be pensioned.

"'Sure,' said Pat, 'and I'm a better laddybuck to-day than you've got anywhere else on the division.'

"But the department wouldn't hear of anything else, so Pat was pensioned. The day of his retirement was fixed for the first of November. When the monthly reports came in on the sixth they were signed 'Pat Maloney.'

"Right then the department sent the roadmaster down to see what had gone wrong. When the roadmaster got down to Section No. 24 he saw Pat bossing the men and everything running smooth.

"'What are you doing here?' says the roadmaster

"'Working,' says Pat.

"'But you're pensioned,' says the R. M.

"'Not yet,' grins Pat.

"'I sent Halloran to relieve you. Where is he?'

"'In the hospital,' says Pat, and grins. 'And he's fifteen years younger than me When you send a man down here that can lick me, then I'll retire.'

"The story was too good to keep. It got to the vice-president, and he gave Pat a job as overseer of the terminal's car-inspectors. It paid the same as Pat's pension, and was created expressly for Pat's benefit."

"Well, I'm not that crazy about working for a railroad company," said Burley. "And besides, on a farm you are your own boss."

"Yeah! In your mind's eye! On the railroad, Uncle Sam looks after you to see you don't work over sixteen hours. On the farm there isn't any limit."

"Things are different nowadays on the farm," objected Burley. "They've got all the best of it, with machinery and automobiles to do the worst of the work.

"Besides, think of the danger we have to face on a railroad. Compare it to the danger on a farm. There's no comparison."

Boomer Jones gave a snort.

"That's what old Pete Punter said when he went out on his farm; Pete was an engineer of the Milwaukee, and was pulling a mail-train when he got the farm-fever. But he played wise and took a year's leave of absence.

"Pete had forty acres of alfalfa and corn, twenty cows, and the Lord knows how many chickens and other stuff. He bought a cream-separator for his wife They decided to separate cream and ship it. Pete figured he would be independently rich in two years if luck came his way.

"But one day when he started to town with a wagon-load of cream, things happened that made him change his mind.

"He was just getting ready to cross a railroad crossing when a passenger-train came along. As they pass Pete the engine gives one long toot of the whistle. The horses give one big jump and are off.

"They left Pete and two of the wagon's wheels in the ditch, and they scattered cream from the railroad crossing to the town, three miles away. Pete was crippled up with a broken leg and a couple of busted ribs for almost three months. Soon as he was able he came back to town, and went back to railroading.

"'Just think!' he says to me one day. 'For thirty years I railroaded and never even got scratched up, and then I go to the peaceful farm and almost get killed. I'm going to stay on the railroad where it's not so dangerous. No more farm for me, Jonesy'"

"Of course," said Burley, "I expect to have an auto, so I can bring the family in once a week to see the shows and do their shopping. But I expect to live and die on the farm."

"And you'd be like Tommy Linn, who pulled the S. P.'s Pride of the Rockies, a mail-train with one Pullman coach and a speed-schedule that was fierce. Tommy was always talking about going to the farm, but he never did. He stayed until they made him quit railroading; and then when he had the chance to farm, he wouldn't go.

"He was sixty-two when they started in to be so strict about examinations. The old man weathered three or four of them before they got him on his eyes. Then they went and pensioned him. It almost broke the old man's heart the day they did it. He had a regular engine just like the other old-timers there; and he knew every nut and bolt in her, and he loved her.

"After he was put on the retired list, he just couldn't keep away from the round-house and yards. When the limited would drive up to the station, the old man would be there to look her over. He'd examine everything about her with as much care and pride as if he were to take her out on her next trip. All the engineers felt sorry for him and humored him.

"Then he finally took to bed. The doctor said it was a nervous breakdown. Even then when he heard the whistle of his engine, he'd turn to his wife and say:

"'Mother, there goes the Eight Seventy-Six.'

"He'd say it in such a sad tone that his wife would have to wipe the tears from her eyes as she'd reply:

"'Yes, dear, I hear her.'

"I was up to visit him one day. And while I was there the train pulled out. When she whistled for the road-crossing, the old man sat straight up in bed and says:

"'Jones, there goes my baby now. Listen to her purr. Isn't she the finest thing you ever saw on wheels? She's no dead one; she's alive! Why, man, whenever anything went wrong with her, she'd whisper and tell me what it was that ailed her.'

"Then he'd spend the rest of my visit telling me how he made up fifty minutes on the fruit-growers' special with her, when her running-time was better than fifty-five per. Or how he swung the government contract; and how the president, on an inspection trip, sent for him to pull the special over the division. He'd always end up with, 'And they threw me out when I got old.'

"One day the limited jumps the track at Race-Horse Cañon, goes into the ditch, and blows up. When the news is passed to Linn, he just turns his face to the wall and passes in his checks. The doctor said 'twas old age; I'll always think 'twas a broken heart."

The telephone rang as Jones finished. Ganes took down the receiver to answer, and Jones borrowed the makings from Doyle. Burley drummed with his fingers on the counter—a sign that he was thinking deeply.

Finally the yardmaster hung up the receiver and said:

"They've changed that call, Burley. You're dead-heading to-night. Think you can dead-head behind three thousand tons?"

"Guess so," said Burley absent-mindedly. "Well, I'll go down and turn in. I'm dead for sleep, anyway."

Jones got up, stretched himself, and followed Burley out. As they went through the door, Jones said:

"I'm going down to the spring to get a good cold drink before I turn in, so I'll walk as far as the roundhouse with you."

The east-bound yards were busy. Lights flashed, cars bumped, and above all came the voices of the workingmen, sometimes raised in anger, at other times joking and laughing, joshing and giving orders.

"Line up for three—"

"Shove eight to clear—"

"I said seven—"

"This ain't any promenade walk; this is a switch-yard—"

"We'll put in a moving stairway for you tender-footed old maids—"

"Don't be afraid to kick—"

"What the Sam Hill's the matter with that pighead now?"

"Wake up, Lazarus; we're trying to get this work done—"

"Trying to get overtime, I guess—"

"Of all the —"

"Number Nine, you—"

"Never was known to get any spot on ——"

"Whee!"

"Everybody works but the switchman—"

"Cut off four —"

"Ride the doghouses in

"Just waiting for pay-day —"

Above the din and roar of the yards Jones made himself heard.

"Can you beat it?" he asked, waving an arm in a vague circle that took in everything about the yards. "Can you match it on a farm? Not on your life! I'd rather throw my feet where I can have plenty of company than to be a millionaire on a farm and be lonesome

"And this is only a part of what you'd miss on a farm. On the farm you'll never go skinning on short time against a passenger, or hear the screeching of the whistle when you go into a town where everybody's asleep but you and your crew. You'll miss the sight of the switch-lamps, the twinkling order boards, and the—most of all, you'll miss the men.

"And where on earth can you find such free-handed men as those that work on a railroad?

"Because why? Just because you're a railroad man—that's a

Dogface scratched his head

"You're a cheerful little scene painter, Jones, darn you! But— Oh, heck! I suppose I might as well take a year's leave of absence. Then you will—"

"That spring-water is the best water in the world," said Jones. "It can't be beat!"

FIRST NEW YORK CENTRAL CONDUCTOR.

IN the August issue of the RAILROAD MAN'S MAGAZINE we printed a picture of New York's first "limited," the historic De Witt Clinton, a little train that in its day startled the inhabitants of the Empire State by attaining a speed of fifteen miles an hour in its daily sixteen-mile run

MARQUIS DE LAFAYETTE WILLIAMS WAS THE FIRST MAN TO COLLECT FARES ON THE FAMOUS DE WITT CLINTON

Now, through the interest of one of our readers, we are able to show you a portrait of the first conductor that collected tickets on that famous train. He is Marquis de Lafayette Williams, who, despite his ninety-six years, is hale and hearty to-day. Mr. Williams makes his home in Chicago.

Mr. Williams's grandfather, David Williams, and the Revolutionary hero, General Lafayette, were close friends. When General Lafayette visited the United States in the early part of the last century he christened with his own name the subject of this sketch

The larger part of Mr. Williams's life has been spent in railroading. He was conductor on the first passenger train which ran on what is now known as the New York Central, and for seventeen years he solicited traffic in Chicago for the Baltimore and Ohio Railroad.

Although out of the game now, Mr Williams is still keenly interested in railroading and watches closely the development of rail transportation in America.

A CIVIL WAR ENGINEER.

Isaac Pennebaker Pulled the Latch in Battle-Scarred Days When Railroading Was as Hazardous as Soldiering.

BY A. F. HARLOW.

OLD-TIMERS from along the line of the Queen and Crescent in East Tennessee, when they visit Chattanooga, are often heard inquiring whether Isaac Pennebaker still lives in the city; and they generally add, "He ran the first engine I ever saw."

Mr. Pennebaker piloted the first locomotive over the Cincinnati Southern into Chattanooga, but his distinguished service goes farther back than this. He sat at the throttle of engines on the battle-scarred railroads of Kentucky, Tennessee and Mississippi during the Civil War, when railroading was about as exciting as soldiering.

All There at Eighty-One.

To-day his half-century of strenuous experience seems to sit lightly upon him. In his eighty-first year, his eye is bright, his mind keen and active, and his memory of the myriad events of bygone days absolutely marvelous. His voice is so steady and strong that he could make himself heard above the roar of a train as well as a man of thirty.

"Yes, I had some lively experiences during the war," said he one morning recently, as he sat on the vine-shaded porch of his comfortable home in Chattanooga. "The time was crowded so full of them that I've forgotten many, I suppose, that would make good stories. When the war started I was inside the Confederate lines, down around Memphis, but within two years, I was pulling Union trains over the Louisville and Nashville.

"We railroaders, as well as the railroad, belonged to whoever was present with the biggest body of men. I've ridden many a mile with a soldier on the seat behind me with gun and bayonet; I've been shot at time and again; my engine peppered and hailed upon with bullets; I've seen the tank of the engine perforated so that the water spurted out like a fountain.

"Railroading was about the most exciting sport known at that time. You never knew, day or night, when you were going to find the track torn up, or a bridge destroyed, or a bunch of soldiers in ambush, ready to shoot the top of your head off as you went by.

"Railroads kept men constantly busy replacing track that had been torn up by the soldiers. Half the time the wires were down so that no orders or information could be obtained. The roads were clogged with troop-trains and supply-trains, and cars for other purposes were scarce.

Train-Time was a Guessing-Contest.

"Schedules became a joke. A passenger never knew, when he started on a fifty-mile trip, whether he'd get there the same day, or the next day, or the day after. His train might be side-tracked somewhere for ten or fifteen hours, or it might take a notion to back up to a station recently passed.

"It was while I was down inside the Confederate lines that I pulled the train south from Memphis, carrying General Prentiss and a lot of other Union prisoners captured at Shiloh and other early battles in the West. It was a harrowing experience for me—worse than it sounds just to hear it told.

"I was running on the old Memphis and Ohio at the time—now a part of the Louis-

ISAAC PENNEBAKER WEATHERED THE HARDSHIPS AND PERILS OF RAILROADING IN THE CIVIL-WAR ZONE, TO ENJOY THE COMFORTS OF PIPE, ROCKING-CHAIR, AND FRONT PORCH IN HIS OLD AGE

ville and Nashville—which ran from Memphis northeast to Paris, Tennessee. We were all more or less under military control, however, so it need not have surprised me much when I was ordered one day to take a train-load of prisoners over the Mississippi and Tennessee down to Grenada, and thence to Jackson.

"These Union prisoners had been brought from Shiloh to Memphis, and were to be taken to prison at Tuscaloosa, Alabama. In order to reach there, they had to be sent around by Grenada, Mississippi, Jackson, and Meridian, almost a circle

"Well, I naturally objected pretty strongly to pulling a train over a road which I knew nothing about, especially as night was approaching; but that didn't count for anything in those times. Two engineers who had been expected to pull two of the prisoners' trains had disappeared; the times were getting so ticklish that a good many railroad men made themselves scarce

"There were three train-loads of prisoners ready to leave the city, and I was elected to pull the second train with the old engine, General Lovell. Charlie Rook, an experienced engineer, handled the first section, while on the third they had to put a green boy who had worked in the yards.

"'Penny,' said the boss to me, 'I want you to sorter keep an eye on this third section, too.' Fancy being asked to keep an eye on a train which you were not supposed to be within a mile of'

Cattle and Box Cars for the Soldiers

'The trains were all made up of cattle cars and box cars, for soldiers and prisoners all rode in such cars during the Civil War—no luxury for them. But on the tail-end of my train there were two coaches carrying General Prentiss, who was taken prisoner at Shiloh, together with several other Union officers and their guards. The responsibility worried me not a little. I got the other two engineers together, and said:

"'Look here, boys, we must be mighty careful, for if we kill any of these people there may be a serious hereafter for us, and that's no joke.'

"I warned Jim to run cautiously, and stay well behind me, and told Charlie that if he heard a lot of sharp warning signals from me, he must hustle out of my way.

"Well, we jogged on into the night, with no definite orders, and not knowing whether the track would be kept clear for us or not. Charlie was the only engineer who knew the road.

"Seventeen miles out of Memphis he stopped for water. I caught sight of his tail-lights across a curve where the country was fairly open, and managed to stop within a few rail-lengths of his train.

"No sooner had I stopped than I heard Jim coming like a wild man—making forty miles an hour, seemed to me. There were no air-brakes in those days, you know, and stopping a heavy train was a tough job. I whistled a warning to Charlie, and he left the tank without getting all the water he needed.

"Do you know, that fool boy chased us clean past the tank before he got himself stopped! If he had smashed those two coaches of mine, and killed all those Yankee officers and their guards, there'd have been the deuce to pay, sure'

Jim Just Couldn't Learn.

"After getting stopped, we all backed up and took water. I gave Jim a lecture, and away we went again. But just before we reached Grenada Charlie stopped for water again, and hang me if Jim didn't pull the same trick on us again! I never could understand why my hair didn't turn white that night.

"I got second chance at the water-tank that time, and after getting all we needed, I just kept the spout wide open and let every drop of water out of the tank—left her bone-dry!

"The tank was one of those old-time affairs—water was pumped into it by a horse operating a treadmill—and I knew that it would be at least half an hour before Jim could get enough water out of it to fill his engine, which would give me start enough to keep him off my coat-tails for the rest of the night. You may believe that I drew a sigh of relief when I got that train-load of prisoners off my hands.

"A short time after that, I was on my regular run between Memphis and Paris, when I was called on to haul a train-load of Johnnies—freight-train, of course—from Memphis up to Paris, on their way to Kentucky. From Paris the road was continued to Guthrie by the Memphis, Clarksville and Northern, and from Guthrie on to Bowling Green it was Louisville and Nashville. It's all Louisville and Nashville now.

"I got the soldiers up to Paris all right, and then their commander ordered me to take them on to Bowling Green. That would have carried me over another road than mine, and as I was unfamiliar with it, and had no assurance that the track would be clear, I refused to do it. My plight would be about like that of a Lake Shore engineer, say, who, when he had landed his train in Chicago, might be ordered by somebody to go right ahead with it over the Burlington or the Rock Island.

Handed the Major a Stall.

"We argued a while about it, and the major made it clear to me that I'd be shot if I refused to go, so I decided to try strategy.

"'All right,' said I, as if I had realized that I had to give in. 'All right, I'll go; but I'm nearly out of wood and water. I'll have to run the engine back nearly a mile to a tank and wood station. Then we'll go ahead.'

"'Very well,' said he. 'Captain A., detail three men with fixed bayonets to go back on the engine with these fellows, and see that they do what they're told.'

"That gave us something more to scratch our heads over; but I had made up my mind that I wasn't going to take that train forward. I was sort of bad medicine myself in those days," interjected Mr. Pennebaker with a twinkle, "and I believed we could take care of those fellows. I found a chance to whisper to my two brakemen who were to load the wood on the tender that they must hop aboard the instant they heard me open the cylinder cocks.

"So we ran back to the wood-yard, and the boys began throwing sticks on the tender. Presently two of the soldiers became interested; and, finding their quarters in the cab a bit cramped, they dropped to the ground, and walked aside a few steps to watch the process. The other soldier remained standing in the gangway.

"I saw that the time had come. Quick as a flash I pulled the throttle open, opened the cylinder cocks, and as we leaped backward, the two brakemen flipped aboard the tender

"The soldier in our midst attempted to bring his gun around, but was hampered for a moment by his close quarters. In that moment I had left the throttle, jumped on him, slammed him against the tender, and as the fireman grabbed him, I took his gun away from him, broke it across the wood, and threw it out into the weeds. The two soldiers on the ground tried to get aboard, and then they tried shooting at us, but they failed in both attempts.

A Job from Jovial Jones.

"We ran back a mile or so, slowed up, and shoved off our prisoner, whom the fireman had had charge of, and then went on back to Humboldt, which was headquarters Here I found a train-load of Arkansas troops standing in the yard, and was met by our superintendent, Jones, with enthusiasm.

"'Penny,' said he, 'you're just the man I want to see! I want you to take this regiment of soldiers through to Bowling Green.'

"'What, go through Paris again?' I exclaimed. 'Not much!'

"And I told him of our adventure.

"'Oh, that doesn't make any difference,' he assured me; 'and this train's got to go! They'll never notice you.'

"'The deuce they won't!' said I, and I was about to refuse positively to go when the colonel of the Arkansas regiment, who had been standing near while we were talking, teetering back and forth on heels and toes, slapped me on the back and said jovially:

"'A'sh aw right, young feller! Leave 'em to me! I shee you don't get hurt. 'F any of 'em laysh a hand on you, jesh holler for me; 'y gad, I'll fixsh 'em!'

"So we started back toward Paris. When we came in sight of the town, I saw that the first regiment—the one I had run away from—had shoved their whole train by hand, piecemeal, out on the main track, to prevent any other man's getting by. We ran right down to it, and I sent a brakeman around to hook it to the front end of the engine, so that we could set it on the switch, and get by it.

"As the brakeman prepared to make the coupling, a lieutenant ran up to him and said:

"'If you touch that drawhead, I'll blow your brains out!'

"With that, I dropped off the engine, and ran back to the colonel, who was already climbing with some difficulty to the ground. I told him of the trouble in a few words, and he roared

"'Sharg'nt! Shquad men—fixsh bay'nets!'

"And we hurried back to the engine. Marching up to the lieutenant, the colonel seized him by the neck and shook him like a rat, meanwhile using language that you wouldn't care to put in the magazine at all.

The Colonel Waxes In—Hic!—dignant.

"'What do you mean, shir!' he yelled 'I've good nosh'n put you in irons!'

"And with that he would give the poor fellow another shake. The colonel being the biggest officer in the vicinity, we did as we pleased; set that train on the siding, and ran by it with our noses in the air.

"We got on up toward Clarksville without further incident. Jones had made arrangements for me to take the train through to Bowling Green.

"The soldiers in the regiment were nearly all as drunk as the colonel, and whenever the train stopped, they would show their athletic prowess by jumping from the tops of the box-cars into the sand or loose earth, if there was any near the track. They kept this up until dark.

"It was quite dark when we pulled out on the long trestle that crosses the Cumberland River bottoms. Here the tender of the draw in the middle of the bridge flagged

me, and handed me an order to leave the train where it was, and run across, with the empty engine, into Clarksville.

"Do you know that those drunken soldiers didn't realize that they were on a high viaduct, and began jumping off, just as they had been doing when we were on solid earth! Thirty-six of them made that leap—it must be at least sixty feet to the bottom there—and nearly all of them were killed. Those who lighted on their feet had their leg-bones driven clean up into their bodies.

"We got to Bowling Green without any more mishaps, and believe me, there was another bunch of passengers that I was glad to see the last of.

Rum Brought Death to Many.

"There was a terrible lot of drunkenness in the armies during the war," Mr. Pennebaker paused to say. "I believe hundreds, maybe thousands of men met accidental death because of it. One side was as bad as the other.

"Some of the railroad men used to consume more than a little of the stuff, too; which reminds me of an incident of one of Morgan's raids through Kentucky. I was running out of Louisville at the time, on the L. & N.

"There was a family at Glendale, a little station just south of Elizabethtown, whose name was Walker. Susie, the daughter of the household, was a friend to all the railroad boys, and used to give us warnings whenever there was trouble along the line. She had a way of finding out such things that was positively uncanny; and whenever she gave us a tip, we felt sure that it was pretty straight.

"We had just passed Glendale, going northward, one afternoon, when I caught sight of Susie, half-concealed in the edge of a corn-field, giving me the stop signal. She didn't dare do it publicly, for one never knew what soldiers or spies were lurking about, and such action might have got her into serious trouble.

"Well, I called for brakes and slowed up as quick as I could, Susie meanwhile vanishing like magic in the corn. The moment we got the engine stopped, the fireman and I shot out into the bushes like two frogs diving into a mill-pond.

"That was always the first procedure when we scented trouble. If there were soldiers or guerrillas concealed near by, with designs on the railroad, the first thing those cusses would do would be to shoot at the engine.

Con. Developed the D. T.'s.

"Well, we lay there for hours, absolutely ignorant as to what was the trouble, but having such confidence in Susie that we felt sure it was dangerous to move on. Our conductor was a pretty heavy boozer, and was already fairly groggy when we stopped.

"While we lay there, he finished the contents of a quart bottle of whisky, and got up as pretty a case of D. T.'s as I ever saw. He galloped all over the neighborhood, yelling and wailing, climbing trees and falling into the brush—it's a wonder he didn't kill himself.

"As evening came on, we saw a big smoke and a glare in the sky to the northward. Morgan had made a raid into Elizabethtown—at least, we heard it was Morgan—and burned two trains. If we had gone in, our train would have been lost, too, and there's no telling what might have happened to us.

"It was a weird experience, lying there in the dark, watching that flickering glare in the sky, not knowing what it was nor what was coming to us, and hearing, away off in the woods, the unearthly howls of that locoed conductor.

Morgan, Attila of the Railroads.

"Morgan was the scourge of that part of the country. During the last week of December, 1862, he very nearly put the Louisville and Nashville out of business. He destroyed practically every bridge, culvert and cattle-guard between Louisville and Bacon Creek, some sixty miles, including the two big Muldraugh Hill trestles, each from eighty to one hundred feet high and five hundred feet long. I spent a great deal of time on construction work about that time—rebuilding track, bridges, and so on, that those fellows had destroyed.

"The guerrillas gave us a lot of trouble, too. The James boys were just beginning their devilment in those days. They were Kentuckians, you know. I knew both Frank and Jesse, and their stepfather, old preacher Samuels.

"Jesse and his bunch of roughs came near getting me one day over 'near Lebanon. I came around a curve on the Lebanon branch, and saw a trestle over a creek blazing merrily, and some fellows galloping around on horses at some distance beyond the creek

"We were to take water at a tank just across the creek, and my fireman, who was pretty deaf—the railroads wouldn't employ such a man nowadays—had already gone out on the tender, and was moving the wood around in order to get at the tank.

"I yelled at him fit to split my throat, but he didn't hear me, and as his back was turned my way, he didn't see the burning trestle. The only thing I could do was reverse the engine and jump, which I did, skidding down the embankment into the weeds

Deaf Fireman Got an Extra Ride

"Well, sir, that engine ran to the other end of the bridge before it stopped, and being in reverse, backed across the bridge again, with the fireman, badly scared by this time, still on the tender. The timbers weren't yet sufficiently burned to give way under the engine's weight.

"The outlaws had ransacked and burned a store or two beyond the creek, and among the loot was a number of bolts of ribbon, which they tied to their hats, their guns and their horses, and then cavorted around, yelping like Indians, and with those long streamers of blue, green, pink and yellow floating out behind them—the blamed rapscallions! They didn't cross the creek to chase us, for which we were truly thankful."

But a mere magazine article can do little toward giving an idea of the number, variety and fascination of Isaac Pennebaker's war reminiscences. He could fill a volume with them, and still not get down to the commonplace ones.

After the war he worked on various railroads, going as far west as Kansas and Texas. In the latter seventies he ran the first construction locomotive which worked on the south end of the Cincinnati Southern as it was pushed northward across Tennessee, and finally, as other locomotives were added, he became boss of the construction-trains

As the road neared completion he was selected by the contractors to carry the first inspection party coming from Cincinnati over the new road, on their last lap through to Chattanooga.

On December 10, 1879, the northern and southern extensions of the track met in the tunnel at Robbins, Tennessee, and the last spike was driven. The party rolled in from Cincinnati, and Mr. Pennebaker took them aboard his engine.

Inspection Trip Was Jonahed.

They were twenty-two in all—officials, contractors, friends, reporters from Cincinnati and New York papers. Of course they filled the cab, and roosted all over the tender.

And a cold, cold rain poured on them steadily and remorselessly all the way into Chattanooga, which was reached at nine P. M. Umbrellas were hoisted by a few, but sparks soon burned them, and left their owners forlorn. The wonder is that some one or several in the crowd didn't die of pneumonia. Chattanooga was never hailed with such enthusiasm by a party of travelers, either before or since—and that's not knocking Chattanooga, either.

Mr. Pennebaker retired from the road several years ago, but is still an enthusiastic member of the Brotherhood of Locomotive Engineers, and for some years past handled the finances of the local lodge with care and exactness. Members had to come across with their dues, or give good reason why not

Don't get the notion that age has made him a grouch, however. Mr. Pennebaker is one of the most genial of men, and enjoys a joke with all the zest of a boy.

"I'm sorry you can't stay longer," he says. "There are a lot more stories I could tell you about the war. Come again, and I'll tell you the rest of 'em."

RAILROAD MEN AS FIRE-FIGHTERS.

REGULAR fire-fighting brigades have been formed among the employees of the Pennsylvania system and the report of the year's losses by fires shows that efficient and well organized work was done.

These brigades are thoroughly drilled and instructed in fire-fighting methods and also in the use of modern extinguishing apparatus, so that during the year 1916 they claim a saving of over $14,000,000 worth of property of the company.

The equipping of engines with fire apparatus has been a big saving factor, for the engine can be shifted about the yard and water and chemicals used promptly, and prompt action keeps a little fire from developing into a big fire. This is perhaps one of the most efficient details of the system, as the fire-fighting apparatus can be on hand and in use before the public fire department can get its engines to the scene

It is also especially useful where there is a fire on adjacent property and the city fire department is concentrating on the burning building, for at the same time the railroad men can protect their own property with their private equipment.

In addition to the well equipped engine there are high-pressure fire lines, chemical extinguishers and automatic sprinkler systems in the railroad yards, all of them having played a part, at some time during the year, in checking or extinguishing small fires or big.

INCENDIARY WORK ON THE PART OF ALIEN ENEMIES IN OUR BIG INDUSTRIAL PLANTS HAS MADE MORE IMPORTANT THAN EVER THE ORGANIZATION OF EFFICIENT FIRE FIGHTING BRIGADES AMONG THE RAILROADS. A GROUP OF PENNSYLVANIA EMPLOYEES IS SHOWN HERE

Safety-First methods are, of course, a part, and an important part, of the training of the employees

The total number of fires for the year throughout the whole system was eight hundred and forty, or one hundred and eighty-nine fires less than in the preceding year, before the fire-fighting system became so well organized.

OLD TIMES ON THE D. & H.

Memories of the "Delaware and Hudson Canal Co., Northern Railroad Department," as It Was in the Dim Days of 30-Odd Years Agone.

COLTON'S GOAT-GETTING MORSE BARRAGE.

Green Assistant Super Ordered All Freight-Cars Moved Every Twenty-Four Hours in Order to Prevent Flat-Wheels—Conductor Kicked at Receiving Typewritten Letters Because "He Could Read Writing."

BY "J. E. M.,"

Author of "Old Times on the El Paso Southwestern," "Old Times on the Great Northern," "Old Times on the Galveston, Harrisburg and San Antonio," "Old Times on the Gould Southwestern," etc.

AFTER an absence of over thirty years, the writer returned to New York—to the big noise of the big city—a short time ago. Of course, I noticed many great changes, particularly in the matter of transportation.

When I left the city, street-cars on Broadway were a comparatively new thing; and the enterprising gentleman who was the instigator of the line, and who had engineered the granting of the franchise through the Board of Aldermen, after a bitter fight, had died in Ludlow Street Jail, where he was incarcerated, awaiting trial on a charge of bribery, while a number of the city fathers, who had voted for and, it was claimed, accepted bribes for so voting, languished in the classic precincts of Sing Sing on the Hudson.

The building of this railroad was strongly opposed by the majority of the people of the city, led by many of the leading newspapers of the day, claiming that the operation of a railroad on Broadway would obstruct traffic, and ring the death-knell of that famous thoroughfare as a business street. The franchise was obtained, however, and the road was built.

Electric trolleys were not invented as yet, and the endless cable had not penetrated so far east as New York, so the good, old-fashioned, faithful, reliable horse was utilized as the motive power.

New Yorkers Opposed Street-Car Lines.

The horse, a few years later, was relegated to the background and superseded by the cable, which in turn gave place to the present underground-trolley system, and some of the very people who so bitterly opposed the building of this road now wonder how in the world they ever got along as long as they did without it, and their sons and daughters declare that it would be simply an impossibility.

It was on one of the cars of the Broadway trolley system, which I had boarded with the intention of riding to the end of the line for pleasure, that I encountered my

old and valued friend, "Mose" Tierney, for many years one of the best known and most popular passenger conductors on the Delaware and Hudson Canal Company—get me? Canal Company—Northern Railroad Department; for that was the name that the present Delaware and Hudson Railroad Company bore in the days of which I intend to write, some thirty-seven or eight years ago. Quite a long time in itself, when one looks back

Well! Well! Well! Mose Tierney!

I could not be mistaken in my man, for there was only one Mose Tierney. Of massive build, and planned on the general lines of a grain-elevator, he could not be mistaken. Although something like thirty-five years had passed since we had seen one another, the recognition was mutual and instantaneous.

Mose's hair had turned from coal-black to snow-white, but his carriage was as erect and his eye as bright and as clear as in the old days when he collected tickets and manipulated the bell-cord and punch on Nos. 1 and 2, the Montreal-New York express-trains, between Whitehall and Albany.

I hailed him with the glad sign, and he responded right heartily. Upon the car stopping in the vicinity of Fortieth Street, we alighted and adjourned to a seat in Bryant Park, near by, where we sat us down to swap reminiscences, and to tell of our respective wanderings.

Mose, though, had never wandered very much farther south than Philadelphia, nor farther north than Rouse's Point, while Pittsburgh was the limit of his western travels. As for me—well, I had "boomed" from coast to coast, and from the other side of the Great Lakes to Rio de Janeiro, and from Vancouver, British Columbia, to Lima, Peru.

When It Was a "Canal" Company.

We, of course, talked much of the old Delaware and Hudson Canal Company, Northern Railroad Department, and of the men with whom we had been associated there so many years ago. And as we talked our eyes grew moist, and we became homesick for a sight of the old and once familiar places.

Mose told me that he had retired from the service some fifteen years ago, since which time he had not been near the old road, while I had been a stranger to it for thirty-five years. This was the first railroad that I had ever worked for, and, some way, I felt that in a measure it belonged to me, or I belonged to it.

Mose had worked for the road for something like forty-five years, and had begun to think that he had a proprietory right in it; and, to tell the truth, I believe that the old rascal has considerable stock of the road in his name.

At any rate, after "chewing the rag" about the bygone days and friends of long ago, Mose slapped the table vigorously and shouted:

"John, let's go up and look the old pike over."

"All right," I replied. "Let's."

And we did, and that is one reason why I am writing this

On to the Haunts of Our Youth!

We took the next train on the New York Central to Troy, but we did not linger in the city of cuffs and collars — just tarried long enough to observe that everything was changed and new to us.

Then we boarded a train for the little village which Mose at one time called his home, and where his wife and several children were buried, and where I, nearly forty years before, had reigned supreme from 7 P.M. until 7 A.M. as "night agent"—some title that, and some class to the lad that bore it—at the large but not unwieldy salary of thirty-five dollars per month, or seventy dollars every two months, as I was fond of saying, because it sounded larger.

When we alighted from the train I observed that it was the same old dingy station, with the same bay window containing the telegraph instruments. The same old crowd of village loafers were congregated on the station platform to be first-hand witnesses to one of the events of the day—the arrival and departure of No. 1; and there was the same old knot-hole in the plank platform, which had served as a tar-

get for the village sharpshooters, who had bombarded it faithfully and assiduously with streams of tobacco-juice for many years before I knew the place, and probably would continue to bombard it for many years to come if they had good luck.

But where was Bill Cramer, the old reliable agent of my time? I put the question to Mose, who told me that Bill is now a high official in the passenger department of a large railroad system.

I have often seen his name on advertising matter of this system, but had never connected the name with the old Bill Cramer I had known so long a time ago. Mose and I meandered up the little crooked street that the villagers dignified by the name of Main Street, to the little hotel that we both remembered so well.

Station Antedated Battle of Champlain.

It was just exactly the same. Things don't change much with the years in these small up-State villages. Yes, it was the same old-fashioned rambling structure, half stone and half frame. It had been built before the battle of Lake Champlain, and had been conducted by the same family since its doors were thrown open to the public, more than a century ago. In its time this hotel has housed many famous men, railroad presidents, statesmen, soldiers, and what not, who came from long distances to enjoy a real old-fashioned, home-cooked dinner.

After Mose and I had refreshed ourselves to repletion with the good cheer the house afforded, we took chairs on the veranda that commanded an uninterrupted view of Main Street from end to end, where, with our feet elevated on the railing, we again talked over the times of a generation ago, when I was a ham operator.

I had come from a small city not far from New York—not a large city surely, but still large as compared with the sleepy little village where I found myself installed in the responsible (?) position of "night agent." All that I had to do was to make out some expense bills, sell tickets for two trains, unload empty milk-cans from a north-bound milk-train, load full milk-cans on a south-bound milk-train, attend to ten or fifteen switch-lights, sweep out the office and waiting-rooms, load and unload baggage from the two passenger-trains, and do the telegraphing. There were a few other little congenial stunts, which required little skill and no brains—otherwise, now that I have grown in wisdom as well as in years, I am afraid that I will have to acknowledge that I would have been unable to fill the bill.

Bill Cramer, the agent, was a good fellow. He was unlike my preconceived idea of a station-agent.

All of you old fellows know that a night operator regards the station agent as his natural-born enemy, whose greatest joy in life is to pile some extra work on the night man—work which the night man sincerely believes he should do himself.

In fact, most of the night operators even to-day are deep-rooted in their belief that the station-agents are banded together to make life unpleasant for the poor overworked and underpaid night operators throughout the world.

Mose recalled to me—as though I ever could or would forget it!—the night I took charge of the station. I was young. I was also decidedly inexperienced, not to say green; and undeniably I was scared stiff.

After landing from the Albany train I presented my letter of introduction to Mr. Cramer. That gentleman gave me a few general instructions, and added that he would go to supper, but that he would return before No. 2 arrived. No. 2, I gathered, was a train south-bound from Whitehall to Albany, of which one Mose Tierney was the commander, or conductor.

The Morse Begins to Splutter.

Mr. Cramer had been gone but a few moments before my telegraph sounder began to splutter furiously. I could make out of the jumble that the train-despatcher at Troy was calling me.

My heart came up in my throat, and the cold sweat broke out all over me. Icicles formed on my spinal column, and my hands seemed incapable of performing their functions.

However, in some manner I managed to stammer out an answer to my call. The

sounder spluttered again for a few seconds, then was silent.

I had not received a word, and was utterly ignorant of what had been said to me, consequently I said nothing in reply; just stood there open-mouthed and pop-eyed, gazing at the troublesome sounder as though hypnotized.

My knees shook under me. I was sure that my heart had stopped beating and that my last moment had come. Then, as the sounder spluttered again and again, I plucked up courage and again answered my call.

"Well?" quoth the sounder—sarcastically, I thought.

"B N," I replied, of course endeavoring to make an interrogation-point, which means, telegraphically speaking, "What?" and which is composed of a dash, two dots, dash, dot, or "D N," but which is usually murdered by hams such as I was at that time, and made to read, "B N." Then, as an afterthought, I repeated the despatcher's query, parrotlike:

"Well?"

It required all of my remaining strength to pound out these simple little four letters in a shaky manner.

Mr. Sydney S. Colton was the train-despatcher on duty at the time. Mr. Colton was, I learned later, as fine a gentleman as ever pounded brass, and as generous a soul as ever trod shoe-leather; but he took keen delight in getting hold of some new operator and having sport with him.

Mr. Colton Gets My Nanny.

A strictly first-class telegrapher himself, he wished to make all the boys on the line as expert as himself, and he told me some time afterward that, in his opinion, the best way to begin their education along these lines was to "get their goat," or, as he more elegantly expressed it, "put the fear of the Lord and himself in their hearts."

Mr. Colton appeared to explode at my asinine responses to his queries which I did not get, and the sounder commenced such a spluttering and clicking that what little courage I had remaining oozed out of my finger-tips. I grabbed my hat and sped through the office door into the night, anywhere to get away from that diabolical, chattering sounder. Down the platform I beat it to the end; then, glancing over my shoulder, I saw the headlight of an approaching train.

I decided that I was not cut out for an operator, and concluded to return to Albany on that train. In a minute or two the train came to a creaking stop at the twist of the old hand-brakes; and, swinging from the steps of the second coach, carrying a gorgeous silver-plated lantern, the upper part of the globe of which was green, there dropped the largest and the jolliest looking man I had ever beheld.

That person was Mose Tierney. He came toward where I was standing, and by the light that shone from the car-windows I could see that he was smiling in a friendly manner. In my hasty departure from the telegraph office, I had forgotten my coat. As I stood there in my shirt-sleeves Mose rightly surmised that I was the new night man.

Mose to the Rescue.

"Hello, son!" said Mose genially, as he reached my side. "The new man, ain't you? Yes! Thought so. Just lend a hand here and help me unload that trunk from the baggage-car, son

"All right, son; that's good," he continued as the trunk was safely landed on the platform. "How do you like it here? You'll find Bill Cramer a good fellow. He's the agent, you know. Don't pay any attention to Syd Colton at Troy. He's all right, too; only he likes to have a little fun with the new boys occasionally."

Then, catching sight of my face, which must have been pallid with fright, he exclaimed:

"Well, you poor little cuss! Has he been ragging you already? Never mind, son; you just go right back there in the telegraph office and report No. 2's arrival and departure, and when I get to Troy I'll tell Mr. Sydney Colton what I think of him. Good night, son! Keep a stiff upper lip; Mose Tierney is your friend."

Then, swinging his gorgeous lantern in a last wave of farewell as he flipped on the passing train, he was gone.

I went back up the platform feeling somewhat better, cheered by the kind words of Mose, and found that Mr. Cramer had arrived during my absence and was in the office. He smiled as he looked at me, and said:

"I suppose S. S. C. got in his work on you, all right!"

I acknowledged that Mr. Colton had scared me, but as I had not understood a word that he had said to me over the wire, I was unable to state whether he was complimenting me or insulting me. Then, having in a measure recovered some of my nerve, I grasped the key and in fairly readable Morse called "S O," the despatcher's office in Troy. Upon his answering me crisply, I reported No. 2 arrived and departed. Nowadays you would call it "OS'd" them, but that term was not yet invented. Then Mr. Colton said to me:

"Got your red lantern lit yet?"

"No," I replied; "not yet."

Told to Hustle Up Some "Red Oil."

"Go find the section foreman," he commanded me, "and tell him to give you a supply of red oil. Then fill and light your lantern, and keep it lit all night."

Now, I was not altogether a fool. I had had that red-oil gag sprung on me when I was a student on the Erie; so, just to show him that my railroad education was progressing rapidly under his tuition, I responded:

"Say, you fresh lump of putty at S O, you can go chase yourself and go right plumb to Hades!". Only I used a stronger term than Hades.

Cramer laughed.

The sounder made a few spasmodic flutters, then I heard it say:

"Ha! Ha! All right, kid; but hereafter please remember that profanity is not tolerated on this wire."

"O K," I answered him. "Don't give me occasion to cuss at you, and I won't."

Mr. Colton and I were the best of friends after that. He was just as I had been told he was—a gentleman through and through, but very fond of his joke.

Shortly after the acquisition by the Delaware and Hudson Canal Company, Northern Railroad Department, of my valuable (?) services, Mr. Colton was promoted to be chief train-despatcher, also working the first trick from eight A.M. until four P.M. A Mr. Fayles, who signed "F," relieved him at four o'clock and worked until midnight, when "Del" Curtis came on and handled things until relieved by Mr. Colton at eight in the morning.

A Few of the Old-Timers.

Mr. Colton held the position of chief despatcher for a number of years; then, when the position of trainmaster was created, he was promoted to that position, filling it with much success for a long period. He resigned to enter the service of the Central Vermont, as assistant superintendent of a division, and rose step by step to the general managership, a position which he held until a few years ago, when, I understand, he resigned by reason of ill health.

Mr. Fayles succeeded Mr. Colton as chief despatcher on the D. and H., and the last I heard of him he was superintendent of a division of a large Eastern railroad system. Mr. Curtis, in turn, became chief despatcher, so Mose told me; but, not caring much for the work, he resigned to accept the agency at Saratoga Springs, where he remained for a time, when he entered the services of the Philadelphia and Reading Railroad, and is now, or was until recently, so Mose says, connected with the traffic department of that system.

Theodore Voorhees, at the time of which I write, was division superintendent. Later, and for many years, he was first vice-president of the Philadelphia and Reading road. I would like to see him now, and observe what changes time has made in him.

Tierney tells me that he remained the same polite, quiet, gentlemanly Theodore Voorhees that we once knew and honored and respected. Mose says he called upon him in his private office in the beautiful P. and R. Terminal building some time ago, and that he was greeted very cordially by Mr. Voorhees.

Mr. Voorhees was always noted for his Chesterfieldian manners. Any one connected with his office, or in his employ, was

treated with the utmost courtesy by the chief, and he required, and usually obtained, like treatment for himself

There was one occasion, however, when this was not the case. A porter employed around the depot and offices, whom we will call Dan O'Rourke—the name will answer as well as any other—burst unceremoniously into Mr. Voorhees's private office in Troy one day. Mr. V. was sitting at his desk. He was alone in the room.

"I want a pass for myself and wife to Mechanicsville," declared Dan, without any preliminaries. "I want to leave to-night: I work here in the building, and my name is Dan O'Rourke."

"Why, that's no way to request a pass," gently remonstrated Mr. Voorhees. "You should introduce yourself politely, and then make your request. Now suppose you go away for an hour and think it over, then come back, and I'll see what I can do for you."

"All right," said Dan

At the end of the specified time he again presented himself at Mr. V.'s desk. Doffing his hat, he inquired politely:

"Is this Mr. Voorhees?"

"Yes, sir," responded that gentleman.

"My name is Daniel O'Rourke; I'm a porter in the building."

"Ah, yes. Glad to know you, Mr. O'Rourke. What can I do for you?"

Dan Gives the Retort Courteous

"You can go to blazes! I've got a pass and another job on the Boston and Albany," responded O'Rourke, as he clapped his hat on his head and strode from the room

Mr. Voorhees used to like to tell this story at his own expense, but it in no way deterred him from demanding politeness from all who had dealings with him, or the general public.

"Do you remember the Four Seasons, John?" asked Mose

I laughed. Remember them! I should smile! Indeed I did remember them, and well. They were a peculiar combination of names. These were Snow, Winters, Frost, and Summers, all conductors, and Spring, who was a flagman for Conductor Winters.

Albert Snow was at that time a grizzled veteran, running a branch passenger-train from Fort Edward to Glens Falls, and making two trips a day to Caldwell, which is now called Lake George, I believe, situated at the foot of the lake of the same name. Tom Frost has a freight run between Whitehall and Troy, Dan Summers having the opposite run to him, while Charlie Winters was a wildcat man.

Do You Know the Wildcat Train?

I wonder how many of my readers who were not railroading thirty-odd years ago know what a "wildcat" train is, or rather, was, for the wildcat is dead—killed like many other old familiar terms by something not quite so picturesque.

A wildcat train was what would to-day be called an extra train, running with no time-card rights, and keeping out of the way of scheduled trains. What was called an extra train then is now designated as a "section"; for instance, No. 1 carrying signals denoted that another train with the same rights, called "extra No. 1," was following.

Nowadays this would be called "second No. 1." Red signals were used on the engine to call attention to the fact that another train with the same rights was following, while white, as to-day, denoted a wildcat train.

It would surely sound queer to the present generation of railroad men to receive an order reading like this:

To Winters & Engineer
Q
Winters will wild-cat from Whitehall to Troy, meet and pass Williams, wild-cat north at Saratoga.
31. T. V., S. S. C.

This was the style of an order to run wildcat in the good old days of the yellow book and the single-order system, which was succeeded along about 1885 by the manifold copies and the double-order system

One night shortly after Mr. Colton had been appointed trainmaster, Conductor Charlie Winters was on a wildcat running north, with orders to meet a south-bound wildcat train at Fort Edward. Arriving at

the meeting-point, and finding that the south-bound man had not yet arrived, Winters pulled in to the side-track to await his coming.

The entire crew had been on duty for many hours; for, be it understood, this was long before any eight-hour or even sixteen-hour law was even remotely dreamed of, and railroad men worked as long as they could stay on their feet or keep an eye open.

Whole Crew Went to Sleep.

Anyway, Winters and his crew were very tired; and after getting in to clear, the crew all went to the caboose to sit down and rest, but the entire outfit fell fast asleep, as did also the engineer and fireman on their engine.

While they were in the arms of Morpheus, the south-bound wildcat arrived and departed without their knowledge. Mr. Colton chanced to be at Fort Edward that night, and dropping into the telegraph office, asked the operator, Ed Ledbetter, what that north-bound train was doing on the side-track.

Ledbetter looked out, and declared that it must be Winters, but that he, Ledbetter, had thought that they had departed upon the arrival of the south-bound train. Seeing no sign of life about the train, Mr. Colton, accompanied by Ledbetter, walked down to the caboose and, entering, found the crew noisily "hitting the hay," with Conductor Winters leading the chorus, his head comfortably, or uncomfortably, pillowed upon Flagman Spring's shoulder. Mr. Colton gazed at them mournfully for a moment without disturbing them. Then Ledbetter said:

"Shall I wake them, Mr. Colton?"

"No," replied Sid. "Let them sleep; for as long as they are asleep they have jobs, and as soon as they wake up they won't have any."

And with this he turned away to the cupola, into which he climbed, giving Ledbetter instructions to tell the despatcher to annul Winters's orders and allow him to remain at Fort Edward until thoroughly rested.

Sid sat in that cupola from 11.30 P.M. until about 5.30 A.M., when the sleepy Winters awoke with a start, yawned prodigiously, and, seeing that it was daylight, yelled: "Holy smoke! Where are we? What does this mean?" not realizing that he had been asleep for six hours or more.

"I think," responded Mr. Colton from the cupola, "that Winter has been resting in the lap of Spring. Now you've had a good sleep, wake up your crew and go to the telegraph office and get some running-orders, and hike to blazes out of here," he concluded as he climbed down from his perch.

He did not fire Winters or his crew. I do not believe, from what I can understand, that he even had them up on the carpet for it, for Mr. Colton was not built upon unreasonable lines.

Al Snow, as I remarked before, had the short run on the Glens Falls branch. Mr. Snow was one of the very oldest employees of the company, and when he passed away at a ripe old age, his funeral which was held at Glens Falls, was attended by many men of prominence in the railroad world, who came to pay their last respects to one who had served his employers so long and faithfully.

The Curse of Favoritism.

Back in those old days favoritism, or "pull," sometimes, even as now, displayed itself in appointments or promotions, and the D. and H. was no exception to the general rule. At times some bond of kinship or friendship secured for some man a position which he was not fit to hold, either by training, education, or nature.

Qualifications did not count. The only thing that was thought of by the one "higher up" was to take care of his protégé.

Mose Tierney and I recalled one flagrant incident of this character that occurred under our personal observation about the year 1880. There was a certain prominent Wall Street man, who was a large and influential stockholder, and also a director of the Delaware and Hudson Canal Company. This man had a cousin or a nephew, or some relative whom he desired to enter the railroad field.

So through this director the relative—Mr. Phillips, as I shall call him, because that is not his name — was wished on to Mr. Voorhees as assistant superintendent. Imagine the latter gentleman's surprise, not to say indignation, when Mr. Phillips presented his credentials. Mr. Voorhees had not been consulted in the matter at all; but he bowed to the inevitable with the best grace possible under the circumstances, and assigned Mr. Phillips to a desk in a small room adjoining his own office.

The new assistant superintendent immediately got busy "inspecting" the line. Now what Mr. Phillips did not know about railroading would fill a large book. He knew an engine from a box car, but that was about the extent of his railroad knowledge.

In his various trips of "inspection" over the line, he succeeded in displaying this vast fund of ignorance to such a degree that he soon became the laughing-stock of the entire division, and yet he himself remained in ignorance of it.

One day while walking through the yards at Whitehall, he observed a number of freight-cars lying on a side-track. He had noticed these same cars there on a previous inspection trip, two or three days before.

Of course, he did not know that they were on the repair-track, awaiting some minor repairs, so he called a passing switchman to him and asked him why the cars were standing on the side-track so long.

New Boss Learns About Flat-Wheels.

"Flat-wheels," laconically responded the switchman, squirting a huge mouthful of tobacco-juice dangerously near the assistant superintendent's neatly polished boots.

"Flat-wheels, eh? That's bad — very bad—ver-ry bad indeed. We'll have to remedy that," said the assistant super. "Now, my good man, what causes flat-wheels?"

The switchman looked at him contemptuously for a moment. Then, discharging another load of amber-colored juice in the general direction of the assistant's feet, he said:

"What makes flat-wheels? Letting the cars lay on side-tracks too long."

And with this piece of useful information he sauntered away.

The assistant superintendent pondered the matter seriously for a long time, and upon his return to his office that night, promulgated the following extraordinary bulletin, which was posted on the following day:

TO ALL CONCERNED.

It has come to my notice that it is the prevailing practise for my trainmen to allow freight-cars to remain on side-tracks for an unreasonable length of time, thus causing what is known as flat-wheels. It is with much grief that I am forced to take cognizance of this carelessness on the part of my trainmen.

As all railroad men should know, flat wheels incapacitate the car for service Therefore, commencing on this date, all freight-cars lying on side-tracks shall be moved at least once in every twenty-four hours in order to minimize this expensive evil.

Be governed accordingly,

(Signed) B. PHILLIPS,
Assistant Superintendent.

This bulletin caused much hilarity on the part of the men, and, I grieve to say, much strong talk on the part of Superintendent Voorhees. Incidentally it also caused Assistant Superintendent Phillips to lose his official head and title. Mr. Phillips proved himself a monumental failure as a railroad man.

"I'll never forget," remarked Mose, after we had had a hearty laugh at the recollection of Assistant Superintendent Phillips and his famous bulletin, "the first typewritten letter I ever received. You know, John, typewriters were then in their infancy, and only a very few of the larger corporations had adopted them for their correspondence.

"They were crude affairs at best, looking like a cross between a mowing-machine and a clothes-wringer with a tin house around it.

"Among the officials who had a typewriter in his office was James W. Burdick, who, you will remember, was our general passenger and ticket agent, as well as superintendent of telegraph. I do not rec-

ollect what this particular letter was about, but that is immaterial.

"You must know that I had never seen a typewriter, and I do not remember that I had ever seen a typewritten letter, and, even if I did, I did not know what it was. So in my reply, after answering the questions asked of me, I, thinking to make a hit, naively informed Mr. Burdick that it would not be necessary for him to go to the trouble and expense of having my letters printed hereafter, as I had gone to school and could read writing.

"I wonder what Mr. Burdick thought of me. He used to josh me about it for years afterward."

So we rambled on from one reminiscence to another until train-time. Then Mose said:

"Well, John, we haven't seen much of the old pike, but I guess we've seen all we want to see. Things are not the same, somehow. I don't recognize this double-track road; it's not my old Delaware and Hudson Canal Company, Northern Railroad Department. Let's go back to New York."

And we did.

Arriving at the Grand Central Terminal, I gazed in awe at that magnificent group of buildings, but couldn't reconcile myself for the loss of the old Grand Central Depot as I remembered it years ago. We boarded the Elevated line here for down-town, and paid a nickel fare. When I first rode on the "L" the fare was ten cents, except for two hours in the early morning and two hours in the evening, when the fare was five cents. Another change!

Arriving in the vicinity of the Brooklyn Bridge, we left the train, and Mose said as he extended his hand for a farewell clasp:

"Well, good by, John! We may never see each other again. I don't like these New York people. I'm going away farther East."

"And I don't like them much, either," I replied. "I'm going away out West. By the way, Mose, how far east are you going?"

"Flatbush, Long Island," replied Mose, chuckling. "How far west are you going, John?"

"Newark, New Jersey," I replied sadly as I walked away to find the Cortlandt Street Ferry.

COUPLING 'EM UP IN PRE-AIR DAYS.

THIS IS THE WAY THE HITCH WAS MADE WITH LINK AND PIN

JUST an even year ago we published an article entitled "Romance of the Coupler," illustrating it with a picture of a man making an old-fashioned link-and-pin coupling. Right away there arose a contention among those who said that a coupling could not be made in the manner depicted, and those who said it could

Well, here's a picture of the operation as it was actually performed on the Toledo and Ohio Central in 1899. Look in your back files, and make your own comparisons

The photograph is by courtesy of Mr. Frank S. Snyder, of Dayton, Ohio.

VENUS DE MILO JUNCTION.

BY HENRY A. FARNHAM AND HENRY P. DOWST.

Did Len the Brakie Marry the Local Pipperino?
Yes, If Her Kid Brother Went to the Circus!

OUNG Robert Emmett Gaffney sat in the sun, where it shone comfortably upon the front steps of Pratt's general store at Milo. In the unmetropolitan air of Milo brooded an August idleness, productive of ennui and the fretful lust for something stirring.

Satan, unfailing resource of the unemployed, seeing the small hands of Robert Emmett Gaffney taskless and inert, smiling, slipped into each a large, ripe tomato from a near-by basket. That is how Robert Emmett would have explained the matter.

He examined the fruit with calculation; weighed each ruddy specimen as one tests the gravity of a baseball; fingered the greasily satin skin; estimated the bulk and spreading possibilities of the pulp, seeds, and juice incased therein; and looked wistfully up and down the road.

Afar off, toward the junction, arose a cloud no bigger, let us say, than an elephant's ear, stirred up by an automobile of the make so widely advertised by its loving enemies. When the cloud reached the approximate dimensions of the whole elephant, Robert Emmett Gaffney withdrew discreetly behind the box which protected the graduated beam of the hay-scales. With a blue and sinister eye he marked the approach of the dust-cloud.

A close-up of the youth shows him registering malice, anticipation, and extreme secretiveness; and the two tomatoes, poised like panthers, ready to spring upon their prey.

Amasa Seekins, real-estate and fire-insurance agent, driving his cheerily bouncing little car, wotted not one single wot of the skilful ambush thus devised for him by Messrs. Satan and Gaffney. Bear witness, then, to the dramatic quality of the situation upon the arrival of tomato number one at a spot midway between Amasa's right ear and his linen collar. The tomato offered no apologies, but uttered one fluent monosyllable:

"Sputsch!"

Amasa Seekins placed an irritable hand upon the stinging area thus attacked, and brought it away ensanguined with the life-blood of that martyred fruit. The small car with the big reputation wobbled and swerved, but Amasa intrepidly clutched the wheel, showing the metal of a hero though a flock of Zeppelins impeded.

The second tomato came gaily out of nowhere, and spread itself like the heart of a lover, upon the insurance agent's sleeve. He stopped his car with an ominous grinding and sputtering.

"Hey, you!" he bawled, to no one in particular, "what you think you're doing, hey? What you think you're doing?"

He picked a tomato-seed out of his right eye, and examined the scenery for his assailant. He scooped the staining pulp from his face and neck, hooking a finger inside his collar in pursuit of portions which had started by that route for his shoes.

Over the village brooded a featureless quiet. Here might the dove of peace have drugged herself to death by merely breathing. In that calm and placid silence Amasa Seekins was the only irritant.

You resented his living. If he presented tangible evidence of unprovoked and ferocious attack, all about him lay the denying

emptiness of the New England afternoon. He had only dreamed those tomatoes.

Disgusted, he putt-putted off toward his place of business above the post-office, dragging behind him his wisp of dust, like the fabled muttons of little *Bo-Peep*. Once he turned and looked over his shoulder.

Robert Emmett Gaffney emerged from the far side of Pratt's store. Seekins considered, but held his course; the boy might have more tomatoes. Besides, Amasa was resourceful.

The youth wandered along the road toward Milo Junction, with the air of conscious rectitude worn by a burglar while passing a policeman. He whistled merrily, proving thus the cloudless clarity of his conscience.

Hearing, off to the north, the droning call of a locomotive, he knew the afternoon potato express from the Aroostook would soon slide into the junction. Len McLeod was braking that train; it was his regular run. Robert Emmett Gaffney considered Len McLeod the greatest man on earth. He quickened his steps.

Robert Emmett Gaffney and Len McLeod warmly regarded each other as possible brothers-in-law. In Len's six feet one of manly excellence you have sufficient explanation of the boy's infatuation; but for Len's desire to cement the relationship, you will seek a reason beyond the freckled face of Robert Emmett, and you shall find it in Rosie.

Rosie was Robert Emmett's big sister. We wish we could tell you about her; forgive our ineptitude in advance, lest we make but a bungling job of the picture.

Mrs. Jim Stewart, the master mechanic's wife, a member of the Milo Women's Club, said Rosie was Venus, without the "day-col-tay" and with two perfectly good arms.

"Venus de Milo Junction," said she, pronouncing it "My-lo," not "Mealo."

Her husband looked blank, since he knew more of air-pressure than of art.

"It's fine to be educated, Mary," he warned, "but don't run that culture business into the ground."

Let us survey this goddess of the joined rails through the fond eyes of Len McLeod. He saw in her a fitting mate, queenly, full-breasted, potential mother of railroad princes.

In her blue eyes glowed the clear light of patience and of courage, in the slender crescents of her brows lay vision and understanding; in the lovely curves of chin and throat dwelt tenderness and limitless affection; in the golden warmth of her shining hair were entangled sunshine and youth; in the tints upon her cheeks bloomed the flower of well-being; and, oh, upon those red, red lips glowed for Len McLeod the unplighted promise of paradise.

Len was too bashful to tell Rosie, as yet, the stammered equivalent of so much appreciation. In this shyness not unlikely played the part of wisdom, for Rosie would have the right of picking and choosing from among—let us see, how many railroaders, first and last, stopped off at Milo Junction in the run of a week?

And then there was Amasa Seekins.

If, out of consultation with Robert Chambers, Nat Goodwin, and the shade of King Solomon, we could come to you with the knowledge of a woman's heart, we might tell you why Rosie hesitated, with Len McLeod awaiting her nod. But for mere mortals, the gods intend some secrets shall remain unpublished.

Big Len, his face shining with good-nature, anticipation, and soap, stepped out of the junction wash-room and returned the cordial greeting of Robert Emmett Gaffney.

"Hello, Len."

"Hello, Bob. How's tricks?"

"Aw, I dunno. I don't have much fun; it's duller'n time here in Milo. I wisht somebuddy'd take me to Bangor; circus comin'. Man around yes'day stickin' up bills. He give Lonny Pratt a ticket for hangin' one in the store window."

"Oh, well, maybe we can fix it so you can go. I'd like to go myself, if I could get a day off. 'Tain't so easy. S'pose Rosie wants to go?"

Bob grinned.

"Maybe; p'r'aps she's goin' with Am'sy Seekins."

"Huh!"

"I fixed him, though."

"How?"

"Promise not to tell, Len?"

"Sure."

"I soaked him with a tomatter."

"When? To-day?"

"Uhuh. 'S afternoon. I was settin' on Pratt's steps. I seen Am'sy comin' in his new whiz-wagon, so I hooked a couple of nice ripe tomatters out of Pratt's basket and hid behind the hay-scales. Gee!"

"So you got him, did you?"

"Bet I did, right side of the face. Golly, wasn't he mad! He stopped and shook his fist and hollered like a loon."

"Did he see you?"

"Don't think so. I run behind the store and hid in the hoss shed. Then I come out on this side and walked along just as innocent. I don't believe he seen me; he'd of chased me. I kind of hoped he would."

"That's a nice story, plugging tomatoes at people—"

"Am'sy Seekins ain't people; he's—he's a—a—yaller-tailed yap, that's what he is."

"What 'd your sister Rosie say?"

"Oh, she'd be mad. Her and Am'sy's great friends."

Len winced.

"Since he got the new fliv," went on Robert Emmett, "she's been ridin' with him. She's goin' this evenin', I heard her tell ma. He's rich, Am'sy is. Buys his clothes down to Bangor, thirty-five dollars a suit."

Of course! Always, in the feminine mind, wages that contest between love and lucre. Darn it! What show had a brakeman, earning seventy dollars a month, against the prosperous Amasa Seekins, who manicured his nails, put on a clean collar every other day, and drove an auto built for two?

Len looked dubiously at the large and competent implements which God had placed at the ends of his arms, and from which no diligence of scrubbing could utterly erase the legible marks of toil. Brains counted these days, and the toll of brains, dollars. No man ever became rich working with his hands, or got what he wanted unless he had the price, a series of figures following a dollar-mark.

Len and Robert sat in silence on a baggage truck. Robert was figuring how he could manage to see the circus, while Len moodily imagined what those competent if grimy hands could do to Amasa Seekins in a stressful thirty seconds.

Presently Len roused himself.

"You ought to be ashamed of yourself," he observed severely.

"Huh? Me? Why?"

Robert Emmett, thus pulled down from a seat upon a cloud, about which circled a lady bare-back rider, a flock of clowns, and a herd of marvelous, mastodonic elephants, sixty of 'em, looked startled.

"For throwin' tomatters at Am'sy. Here's a quarter. Don't ever let me hear of your doing that again."

"I'll save it toward goin' to the circus," gloated the boy.

"Of course, if Rosie should happen to go with me, instead of Seekins," confided Len, "we shouldn't think of leavin' you behind."

"Come right in," cried cordial Mrs. Gaffney, when later that evening the big brakeman presented himself at her house near the junction. "Of course I ain't no real substitute for Rosie, but I'll try to be bright and entertainin'."

She was a kindly, round little woman, with eyes that twinkled while they searched your sacredest thoughts. She knew men and women, and no clairvoyance gave her power to read souls, but experience told her what a human being would do under given conditions.

"P'r'aps I didn't come to see Rosie at all," ventured Len.

"I know it; you come to talk about Rosie."

"How'd you guess?"

"I don't have to guess anything as clear as that. Bob told you she was goin' out."

"Bob's a nice boy," remarked Len conciliatingly.

"No, he ain't; he throwed tomatoes at Mr. Seekins. Then you gave him a quarter for it; you'd ought to be ashamed, both of you. I licked Bob, and put him to bed. I'd ought to do the same with you, Len."

The big fellow grinned. "But who told you about the tomatters?"

"A little bird."

"Named Am'sy Seekins, the half-baked sneak!"

"I couldn't overlook it, could I? I got to bring my boy up as well as I can, and if he gets in mischief what can I do but correct him?"

"Mrs. Gaffney," suddenly began Len, swallowing a portion of his tongue from embarrassment, "how well does—does Rosie like Am'sy?"

"I don't know. He's a very well-to-do young man."

"But ain't there anything but money in this world? Don't girls look at a man unless he's got a pocketbook with the mumps?"

"Girls look at a man with money, or a man without, according to how he acts," observed the old lady.

"Go on," urged Len. "You're holdin' back somethin'."

"Len, what makes you boys that's been born and brought up around here let Amasy Seekins get ahead of you? Rosie likes you fine; but you shy at a dollar-sign like a colt at a stray umbrell'.

"Now let me tell you somethin'. I ain't got nothin' to say about who Rosie marries, so he's respectable. She'll do her own pickin' and choosin'. I hope she's got sense enough not to marry no walkin' savin's-bank book, without no red blood in him. How much pay do you git, Len?"

"Seventy."

"That's all you're goin' to get the rest of your life?"

"I sh'd say not," bristled Len, with signs of truculence. "The division super started in brakin'. My chances are as good as anybody's. The railroad business is the finest business in the world, with more opportunities—"

"Land sakes! You don't have to take my head off, Len McLeod. But I'm glad you've got some spunk. I thought maybe you was too soft and good-natured to—"

Mrs. Gaffney hesitated; inside, she was smiling slyly. Then she went on:

"Lennie boy, I despise that namby-pamby, sweety-sweety Amasy Seekins. For goodness sake wake up! Show a little ginger!"

"Maybe Rosie don't realize what a poor thing Am'sy is," ventured Len.

"And don't you be fool enough to tell her. Praise him up. He's probably givin' you fits behind your back, and that 'll make Rosie sympathize with you. Girls like to see a man big and broad-minded and magnanimous. Rosie's above small meanness; she'll see you're superior if you don't stoop to back-bitin'.

"But let me tell you one thing. Make Seekins look ridiculous if you get a chance. A girl don't want the man she's interested in to be a laughin'-stock. Remember that, Len."

"If that's so, I wish the whole town could of seen Amasy this afternoon, all splashed up with tomatters. Must of been funny enough! I guess I better put Bob on my staff regular."

"Len McLeod, if you put that scamp up to any more mischief or pay him any more quarters for his deviltry, you'll have to settle with me, and it won't come cheap."

Thereafter, when Rosie mentioned the name of Seekins, Len said something nice about him.

"Fine fellow," he would say. "Yes, smart, too. Makin' money. He's got brains; I wish I had his intellect."

"Len McLeod, don't run yourself down to me. I guess I know you have brains. You make me feel real bad when you compare yourself like that with Mr. Seekins."

"He's got a gasoline buggy," Len went on. "Some class to him! I s'pose I'll live and die without ownin' so much as one tire."

"Money isn't everything," rejoined Rosie.

"Oh, I don't know. A fellow don't get far without it. I'm getting a raise next pay-day."

"That's different," temporized the Venus of Milo Junction.

She couldn't understand her big lover these days. She liked him more than ever; but he was so assured.

"Len, what's come over you?" she queried.

"I been readin' a book."

"What book?"

"'Success in Love, Courtship, and Matter-Immony,' by Helena Heartbalm."

"I can't say it's done you much good," snapped Rosie. Len chuckled.

Amasa Seekins continued to pursue and nimbly to overtake the fleeting dollar. His was one of those pinched intelligences finding incomprehensible every equation not monetary. People used to say no dollar ever looked the same after Amasa had handled it. Now he discovered a new source of income, the Fearless Fire-Fighter's Friend.

The general agency was in Bangor, and thither traveled Amasa to secure an allotment of territory and samples of the device for demonstration. He went over the road in what he was pleased to call his "motor-car," starting in the morning, returning at night.

Rosie Gaffney went with him.

"Fine; nice trip," conceded Len, a little startled, when Rosie announced to him, the night before, her intention of spending thus a whole day with Seekins. "You'll enjoy it. It's going to be a nice day, too."

Now, in the great game of love, some of the same elements enter as in horse-racing and prize-fighting. If possible, get your opponent's goat! Rosie was not pleased, for Len's ruminant pet, fantom though it be, seemed still to amble contentedly by his side, while her own, she admitted, didn't always come when called. Len was far too indifferent; she wanted him to care a little.

Yet Len was not so satisfied as he appeared. Was, then, Mrs. Gaffney's dope wrong? Couldn't one overdo this attitude of fatuous complacence? It was bitter on his tongue.

He met young Robert Emmett Gaffney in Milo village next day.

"Sister Rosie's gone off with Am'sy Seekins," announced the youngster.

"So I heard."

"Like it, Len?"

"What do I care?"

"Heaps, I bet. Who's going to take Rosie to the circus? You or Am'sy?"

"She says she's promised Amasy."

"Huh! You're a hot one, you are. 'Fore I'd let another feller run off with my girl!"

Thus tauntingly did Robert Emmett Gaffney, viewing the slipperiness of circus tickets, seek to provoke aggressiveness in the big brakeman. Len felt his humiliation. He was losing his jaunty self-confidence. After all, he guessed Amasa had "put it all over" him.

Next day the insurance agent announced publicly, by posters and other available publicity methods, his intention to deliver to the people of Milo and surrounding villages, on the following evening, a message of vital import. He proposed to make public test and demonstration of the Fearless Fire-Fighter's Friend by quenching a great blaze to be kindled in the post-office square.

This, the State agent in Bangor had told Amasa, was the proper way to advertise a fire-extinguisher. The agent also counseled hiring a band to lend gaiety to the occasion. Amasa didn't care about lending anything which bore so little interest.

A half-dozen men and boys, under Amasa's direction, stacked up a great pile of boxes, barrels, and other light lumber, as if in preparation for a Fourth of July bonfire. This edifice, Amasa announced, he would ignite at eight-thirty, sharp; and when it was well akindle, he would show the populace what the Fearless Fire-Fighter's Friend would do.

From Bangor he had brought three sample extinguishers, tubular contraptions, painted a bright and varnished red, and filled with the magic fluid which should reduce to dead embers the fiercely blazing fuel.

These, ready for use, he placed in the bottom of his automobile, as it stood in the Widow Apthorpe's stable, used by Seekins as a garage. Then he went to his boarding-place and, in anticipation of his triumph, consumed a large steak with onions and fried potatoes.

Every one in town turned out to see the demonstration. Things didn't happen often enough in Milo to warrant overlooking a bonfire, even though it be advertised not to burn.

Len McLeod and Rosie walked over from the junction to see the fun. Rosie was full of her trip to Bangor, and Len stood for it like a man.

If she had told him all that really happened, you can't tell what he might have done, for on the way home Amasa had proposed. She had not accepted him; but on the other hand he was not entirely sure she had turned him down.

A crowd surrounded the pile of inflammables, and Amasa was present, in fine feather.

"No matter how much of a start she gets," he explained, in a tall, thin, and somewhat croaky voice, "the Fearless Fire-Fighter's Friend puts her out instantly. No fire can live in contact with these chemicals. They form a sort of coating over the flames, an envelope of noncombustible gas, and smother them. It's so simple—well, it's half past eight. Some one give me a match!"

He stooped and ignited the handful of shavings at the base of the pile. A glow appeared and waxed, sparks shot up, the wood caught, and soon the entire structure was alight.

"Give it a good start," warned Amasa, waving back the crowd. Then, his moment of triumph arriving, he advanced and aimed at the burning pile the Fearless Fire-Fighter's Friend.

He worked some valve or plunger, which the crowd did not see clearly, and a thin stream of liquid issued from the nozzle. When it struck the flames, they suddenly increased in volume and ferocity, and Amasa retreated. A wave of laughter rippled through the onlookers.

Unbelieving, Seekins shook the cylinder frantically, and tried again. The fury of the flames grew greater. In desperation, Amasa turned on one after another, until he had applied all three of his samples. With each trial the result was the same.

"Hooray for the Fearless Fire-Fighter's Friend!" cried a voice.

It was Len McLeod's. A vast shout of mirth rattled the stars. Laughter, jeers, sarcasms greeted the crestfallen Amasa.

"Forms a coatin' over the flames," said one.

"You bet; smothers 'em."

"Fire can't live in contact with them chemicals!"

"Haw! Haw!"

Again came the voice of Len McLeod.

"Hooray for Amasy Seekins, the Fearless Fire-Fighter!"

The crowd became enthusiastic. The fire burned hilariously. If the Seekins's experiment had succeeded, the assembly wouldn't have had half so good a time.

Amasa fussed about, stewed, protested there was some mistake. Then he looked at his hands, moistened by some of the fluid from the extinguishers. He sniffed his finger-tips. Thereupon he lost his head.

God did not make Amasa Seekins a brave man, but chagrin made him a rash one. He swept the encircling throng with a frenzied gaze, until his glance fell upon Len McLeod.

Len stood there, bland and smiling, and on his arm leaned Amasa's girl, amused at the insurance agent's discomfiture. An insane idea possessed Seekins; McLeod was in some way back of this failure.

"Look out, Len!" cried Rosie in terror, for Amasa Seekins was charging straight upon the big railroad man.

He aimed a ferocious blow which might seriously have damaged Len's good looks. The latter extended a competent hand and stopped his assailant as one would stop a child.

"Hold on, now Amasy," he soothed. "Don't get messy!"

"I'll show you," grunted Seekins, with other words both unpretty and impolite. "I'll teach you to cheer and laugh and make fun of me, you big—big—big baboon, you!"

Len grinned, and caught Amasa by the collar, spinning him around gently, but oh, so irresistibly. If you have seen good drop-kicking at a football game, we need not describe what happened to Amasa.

When he got what was coming to him, he sailed a dozen feet through the air, and didn't stop traveling when he touched ground, but kept right on moving. The crowd parted and let him through, and closed after him. Some boys started in pursuit, but Amasa's lead was too great.

After a while the throng melted away, and presently Len McLeod found himself on the Gaffney piazza, in the Gaffney hammock, with one arm around a Gaffney waist. Hours passed, while conversation continued.

"I never liked him," averred Rosie. "I'd rather have you with your small pay and good prospects than him with all his money and his auto and his everlasting airs! But Len, dear, you came near losing me, when you acted so indifferent. What's the use having a lover if you can't make him jealous?"

"Len," called a soft voice from the doorway.

It was Mrs. Gaffney's.

"Would you mind steppin' here a minute? Up-stairs, I mean."

She led the way to a chamber, where lay Robert Emmett Gaffney, sleeping the sleep of innocent fatigue.

"Sniff him," commanded Mrs. Gaffney tersely.

"Kerosene," announced Len.

"Look at them hands."

"Red paint, sticky red paint," said Len. "Here, young feller, wake up!"

He shook the sleeper, to whom consciousness returned with reluctance. Robert Emmett rubbed his eyes, and stared bewilderedly about.

"Where were you to-night?" demanded Len sternly.

"Am'sy Seekins's bonfire."

"Where before that?"

"N-no place!"

"Who put kerosene in Amasa's extinguishers? Did you?"

"'Course not—honest Injun I— Ow, ow, Len! Don't, that's my sore leg! Quit, will you, Len! Ow! Yes, I did; I found 'em in Am'sy's automobile, standin' in Apthorpe's stable. I dumped out the other stuff and filled 'em out of mother's can—"

"I missed it," said Mrs. Gaffney, a baleful gleam in her eye.

"What for?"

"So's—so's to make—make Am'sy ridridic'lus! Did, too. Gee! Didn't the gang holler! And the way you h'isted Am'sy—"

Robert Emmett stopped short and surveyed his mother, but could not meet her gaze. He turned again to Len.

"Len," he pleaded, "who's goin' to take Rosie to the circus?"

"I am."

"'Member your promise?"

"Uhuh!"

Len nodded and grinned.

"All right," said Robert Emmett Gaffney cheerfully. "Come on now, ma; lick the tar out of me!"

HOW WE ARE DOING "OUR BIT"

BY J. L. WEST,

Freight-Traffic Manager, Missouri, Kansas, and Texas Railway, St. Louis, Missouri.

TRAFFIC men set themselves the task of finding misuse of cars by light loading and detention, and taking the actual cases to the shippers. Our plan is:

Examine station records daily to get "cases."

Apportion among ourselves the larger users of cars, each man giving special attention to the shipper assigned to him. Show him his patriotic duty and the advantages to him of quick despatch and the utmost use of available car space. Help him devise schemes for double loads.

Detect delays to shipper's order freight consequent upon the non-arrival of bills of lading; securing bonds under which cars can be promptly released; urging the handling of bills of lading through the fewest number of banks.

Devise, in conjunction with operating officials, schemes to reduce the number of package cars without impairing the service.

Report delinquencies of employees which result in delays to equipment, but in so doing avoid all appearances of captious complaint or criticism of individuals.

"THE COMPANY OWNS IT—SWIPE IT!"

Switch-Lamp Oil, Telegraph Wire, Brasses, Locomotives, and Station Buildings Are Some Items to Suffer.

BY DANIEL DIXON.

LAST year one of the great Western railway systems lost enough through theft to purchase four locomotives of the Mallet type. Other roads lost in proportion. Probably ten per cent of the thieves were caught; about fifty per cent of those caught were convicted.

For it is yet too true that in many rural communities it is counted no crime to steal from a railroad company. A jury is almost always lenient with a railroad thief, as they are with railroad trespassers.

A few months ago on a Western railway an engineer began to complain that switch-lights at a lonely passing track were not burning. The section foreman, whose duty it was to see that they were lighted, was notified to use special care to see that the switch-lamps were in good condition, as the switch was approached in both directions by abrupt curves.

Court Trial Availed Nothing.

As the complaints continued a special officer was sent to the place, and the first night discovered a man emptying the lights. He used the oil for home consumption. In view of the fact that the thief was a man of reasonably good character—"a poor man, while the company was rich," as the lawyer defending him asserted at the trial of the case—the defendant was sentenced to one day in prison and paroled during good behavior. When the lights were not lighted a few nights following the trial the brawny section foreman watched and again caught the thief.

This time there was no court trial; but a certain man was confined to his bed for a week or two from the effects of a stout club judiciously administered. The robbery of the oil ceased.

One of the most daring and ingenious thefts occurred during the time when the Eastern portion of what is now Oklahoma was known as the Indian Territory. The Missouri, Kansas and Texas Railway crossed the lonesome prairies without another road paralleling its tracks for a space of a hundred miles.

Because of the thousands of cattle roaming the prairies along its lines the road fenced its right-of-way before there was a law requiring it to do so.

Costly Wire in Lonesome Waste.

Some time after the fencing operations a telegraph company—the Postal, I think—strung wires on a line of poles opposite the Western Union poles, which were on the west side of the track.

There were but two wires on the east side line, but they were copper metallic circuits and costly. The poles were large and sunk deep into the ground. All in all it was a line that was put up to stay, and to give as little trouble as possible.

The gloss had barely tarnished when a man named Rose appeared on the scene. For several days he traveled up and down the road, making friends with the trainmen, especially those on the local and slow freight trains.

Rose was an Easterner, as one could tell by his talk, and as he was a whole-souled, good-natured fellow, the trainmen soon grew to like him, and did not at all times charge him for riding up and down the division.

He carried a pair of Klein's hooks, or climbers, and was known as the lineman of the new lines.

That summer was dry in more ways than one. There was a drought in the first place; and in the second it was the summer when deputy United States marshals carried many a poor trainman to court for having a "nip" of the hard stuff with him, as Rule G was not enforced then as it is now.

Rose always had a bottle with him, and a thirsty boomer, whose layover was at Atoka, in the Indian country, which was dry, was always welcome to a "snort."

Half a dozen times, as the trainmen remembered afterward, Rose loaded a coil or two of copper wire into an empty car, rode with it to another point and threw it off. No one paid any attention to him, for he was a "good fellow."

Along in early autumn a heavy rain fell along the line of the "Katy" in the Indian Territory, and Rose disappeared.

"Grounds" Followed Rainy Spell.

A day or so after, even before the rainy spell had ceased, a gang of linemen came up from Dallas and began to inspect their line. It wasn't working worth a cent. Tests showed all sorts of "grounds" here, there, and everywhere.

When they began their inspection the linemen were amazed. In places where the fence ran over the prairie and was in the clear for a mile or two one nice copper wire was cut completely off the poles, each end being fastened neatly to a fence wire, which carried the current well enough as long as the weather was dry.

When the rain began the fence wires "grounded" and completely destroyed the circuits.

At the same time the rain destroyed all traces of Rose and his confederate, although cattlemen, when questioned, dimly remembered a man with a covered wagon who made trips to and fro along the Katy railroad. They were never caught.

Five or six years later the writer, who was one of the innocent assistants of Rose in helping him load and unload great coils of copper wire, was in Cleveland, Ohio, dead broke. While passing a small pawnshop he happened to glance in and saw Rose behind the counter. Entering he greeted the man by his name.

"I'm not Rose now," he laughed uneasily. "How're you fixed?"

I told him I was in such a condition financially that if cattle were selling at one cent a cow I couldn't buy one hair off the hide.

"Take this," he said.

He handed me a five-dollar bill

"Tut, tut; don't mention it," he said easily when I started to thank him. "Always glad to help a friend."

"I'll be out of town for a few days, but if you don't strike pay-dirt by Sunday come around again. I'm open Sundays until noon."

Sunday came and I went around. A new face appeared behind the counter.

"Where's Rose?" I asked. "The man who was in here Wednesday."

"Don't know," the man replied shortly. "He's gone. I bought out his business. He'll not come back."

I had no intention of reporting him to the authorities, as the crime had been outlawed, but he probably was suspicious and had left the city. But he surely pulled off an ingenious theft.

During the panic of 1908-1909 the Chicago, Hamilton and Dayton Railroad pushed several hundred coal-cars which were not in use onto a spur north of Hamilton, Ohio, to await better times when they would be called for.

Some one with an industry which should have been put to better use jacked up the boxes and stole practically all the brasses. The thief was never found; neither were the brasses, which represented a good amount of money and which probably netted the thief a neat sum.

Sleuthing for Angle-Bars.

The *peon* Mexican is not a thief by nature, but he has no conception of property values. When the Pan-American Railroad was building from San Jeronimo to Tapachula, in southern Mexico, angle-bars began to disappear from the rail-joints of the newly constructed road.

A close watch was kept, but the thieves were smart enough to avoid the watchers.

A construction foreman had a bright idea. He unearthed a can of red paint and painted the track-bolts with a brilliant red-car covering. Then, after several hundred more angle-bars had disappeared, he made a short tour of the country adjoining the track and closely inspected the hands of all the natives he met.

On the Trail of the Streak of Red.

At one village he passed through he met a man whose fingers showed red. He followed him to an outlying village and found the angle-bars.

Every grass hut in that village was fenced in by a neat fence made of angle-bars set into the ground. Babies played with angle-bars. Gardens were divided with rows of angle-bars laid end to end. Some of them were painted red, as were the hands of many of the villagers.

When questioned the leading man of the village said he regretted exceedingly that his people had caused the railroad company any trouble, but, he added, they thought that as the wheels did not touch the angle-bars they were useless and were just put on the rails for ornament.

When the foreman explained the danger they were causing by taking the bars, the "*jefe politico*," or mayor of the village, bade his people return them all. There still are little fences of angle-bars in that village, but most of them were scrupulously returned.

The theft of a complete locomotive is something so uncommon that it deserves a place here. Down in the piny woods of Louisiana there are many trails over which rails run into the woods, where small engines haul logs to the mills situated near the main lines of railway.

Mystery of the Missing Locomotive.

One day an enginer left his engine and went over to a sawmill hotel for dinner. His fireman had already gone. The conductor and rear brakeman were at the station and the head brakeman was not near the engine.

No one heard anything until the fireman and engineer returned from their lunch. The train was there but the engine was gone. After a search of the yards, the facts were reported to headquarters.

That a big Kansas City, Pittsburgh and Gulf engine should disappear as if it were a plugged dime was something no one could realize, but the fact remained that the locomotive was gone. The engineer and fireman "dead-headed" back to Shreveport on a passenger-train, while another locomotive pulled the train in.

A week after, while in search for some cattle, a farmer found the locomotive abandoned on the end of a spur three or four miles from where it had been stolen. Rains had made the rails rusty after it had been driven over the unused track and no one thought the rails and flimsy bridges of the log road would hold up a main-line locomotive.

The tank and boiler had been drained, but no other damage was done. Sectionmen filled the boiler; a wood fire was started and the engine, under her own steam, was delivered to its rightful road.

A Timber Contractor, Mayhap?

For a time there was talk about a timber contractor who needed a locomotive for a few days' use, and took the one above referred to, but nothing could be proved and the matter finally was dropped.

For months after the occurrence enginemen used chains with switchlocks and any number of ingenious devices to protect their engines while they were absent, but there is no record of another theft of the kind.

In the summer, when the Kansas wheat-harvest is on, it is the custom of railroads entering the State to allow harvesters to ride free if they wish to take the box-car route. There is no bulletin to the effect that trainmen shall carry these casual laborers free, but it is an unwritten law among farmers and railroaders that the laborers shall not be bothered while the harvest is on.

After the wheat is gathered, the men have learned that it is safer to ride the cushions and pay fare.

These men usually camp near some cen-

tral point, where farmers can come and take them to the fields in their vehicles. which in Agricultural Kansas means a "tin Lizzie."

In a camp near Hutchinson, Kansas, a hundred or more men were encamped. The river ran near by and a railroad track paralleled it.

One night, while a freight-train from the West was waiting to enter the yards, a brakeman noticed a commotion in a stock-car. Thinking it was one of the stockmen accompanying the shipment trying to get some of his cattle to their feet, he paid little attention to the rumpus until the door opened and a man and steer rolled out.

Rough-Riding a Steer.

The steer hit the ground running and the man straddled him. As the two passed the camp a shot ran out and the steer fell. By this time the brakeman had his hands full trying to close the door, as several other steers had rolled out.

By the time he had the door closed and had called other members of the crew and the stockmen, there was a dead steer near the camp. Most of it was neatly cut up and hidden.

Inquiry at the camp divulged the fact that every mother's son had been asleep through all the racket. No one could be found who knew a thing about the steer, who opened the car-door or who shot it and cut it up and hid the choicest pieces.

It had just happened, like *Topsy*, and in court the next day the campers were not really certain there had been a steer killed, as all traces of it had been removed through the night. The railroad was the loser, as none of the campers were convicted.

Abducted the Depot.

An example of theft with comic-opera attachments occurred when the Cherokee Strip portion of Oklahoma was opened to settlement in the autumn of 1893. The government established a town at Pond Creek, while a townsite company established another embryo city at what the railroad called Round Pond, two miles distant from the government city.

At the government townsite the railroad constructed a little station building on which was painted a big sign:

ROUND POND.

At the townsite company's Round Pond there was nothing but a whistling-post, a sign-board and a bank of gravel for passengers to use for a boarding-platform.

One night the enterprising citizens of the townsite company's town stole the little station building and carted it to their town. The railroad company moved it back to its original location. Again it was stolen.

This time the railroad decided that such enterprising citizens were entitled to a station building, and it was left where they placed it.

The question of a name, however, was settled in the courts, and the townsite company's town was named Jefferson, after the kind of democracy they have in Oklahoma. It bears the name to-day, and is a thriving little town below Caldwell, Kansas, on the Rock Island.

A Long Chase for a Currency Crook.

An express messenger named Mercer, whose run was on the Baltimore and Ohio Southwestern between St. Louis and Cincinnati, mysteriously disappeared from his car one night several years ago. A check of the car revealed everything intact except a package of bills shipped from the Bureau of Engraving and Printing at Washington, District of Columbia, to a Western bank.

These had not been signed by the president and cashier of the bank. Search for Mercer was instituted but without result. The man seemed to have disappeared as if the earth had opened and swallowed him.

Two years later one of the bills was discovered up on the Canadian line; another turned up in a bank in Omaha, and a Kansas City mail-order house received one from a customer in Central Missouri.

Government officers began to trace them back to where they originated. They were a year in doing so.

The trail of each bill led to a small town in California, where Mercer was found. He was never punished, however, as he was dying of consumption when discovered.

The queer part of the story is that he had nothing to do with putting the notes in circulation. The bundle was stolen from him a few weeks after his arrival at the California town, and it was a local young man who forged names to the three notes and subsequently put them into clandestine circulation.

Then his nerve failed and he concealed the balance. But the government Secret-Service officers trailed them.

It is well to note, however, that out of their many thousand employees, the express companies find very few dishonest men, the percentage being something like one in every seven thousand.

HOW WE ARE DOING "OUR BIT."

BY EUGENE E. POTTER,

Locomotive Engineer, New York, New Haven, and Hartford Railroad Company.

STAYING on the job and saving coal are my two most valuable contributions to the country in its present crisis.

Railroad labor has never been so scarce as it is to-day. The draft has taken many men and many more have volunteered. The railroad regiments which were forced to help France were recruited from the employees of the railroads; and the roads were short-handed before those men volunteered.

The first great duty of every railroad man is, therefore, to work as hard as he can and to remain on the job.

I have been railroading for over forty years. I am at the age where many men retire and I have been working much longer than many other railroad men who have received pensions But I'm as fit as a fiddle and able to do a full day's work with as little effort as a man thirty years younger.

As long as I'm physically able to work I'm going to work. And during the present war I intend to see to it that I keep physically fit.

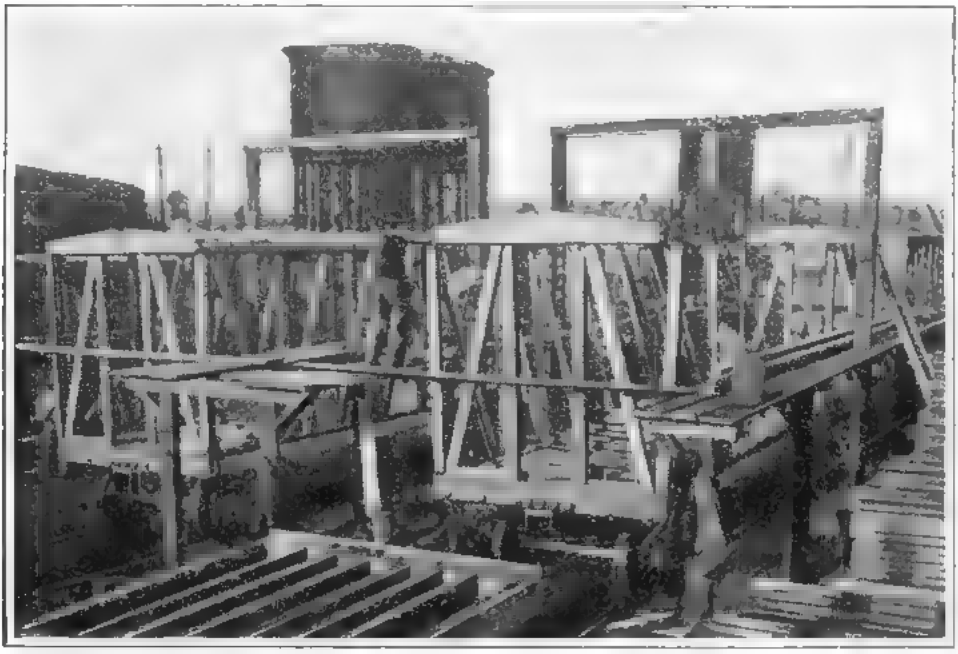
As a locomotive engineer I have another way of helping. This is in the saving of coal The man who doesn't know anything about railroading would be surprised to know how easy it is to waste coal in a locomotive. A delay on a passing siding, poor firing, the actual running of the engine, careless firemen allowing coal to fall off the sides of tank and each side of gangway, hooking fire too much all these things are causes of coal waste.

I run my locomotive so I can get the most out of her with least amount of coal. The saving of one shovelful in eight means about one ton a day and with our more than 1,200 engines in service on the road, together with all other railroads in the United States, the total would mean many thousands of tons saved daily.

Another important factor is the necessity for manly honesty among railroad men in reporting violations of safety precautions, such as improper flagging or failure to use fusees at proper times. Accidents would be reduced if engineers and other railroad men would only help to bring up the standard of efficient and safe flagging by reporting to the officials of the company violations of the rules Accidents are not only dangerous, but they decrease the efficiency of the road in doing the work necessary for the government and the people at a time when every ounce of effort must be effectively used.

The way to win this war is for every one to cooperate and do his share to the best of his ability. We have to help each other, and we all have to bend a little.

MAKING FREIGHT-CARS BY THE GROSS.



IN ASSEMBLING, THE TRUCKS ARE LOWERED INTO PLACE FIRST, AND THE FRAMES SET ON TOP OF THEM. THEN THE SILLS ARE LAID ON, THE SIDE-WALLS SET UP AND BOARDED, AND THE CAR IS PAINTED AND FINISHED. ONE CAR AN HOUR IS THE RATE OF ASSEMBLAGE

ONE OF THE BIG POWERS BEHIND THE GUN IS THE FREIGHT-CAR, SO IN ORDER TO SUPPLY IT AT THE TREMENDOUSLY INCREASED RATE THAT WAR DEMANDS A HUGE PLANT HAS BEEN ERECTED AT LOS ANGELES, CALIFORNIA

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FROGS FROM THE TIGHT LITTLE ISLAND

Brief Paragraphs Covering the Operation of the Railroads of the United Kingdom.

BY WILLIAM J. PARRY.

There are nearly three hundred separately constituted railroad companies operating in the United Kingdom.

The ownership of these companies is divided over twenty-three thousand miles of track.

The properties of about one hundred of these companies are "leased" or "worked" lines.

The largest system in the United Kingdom is the Great Western, which operates three thousand miles of track.

The London and North Western is the premier company in point of capital and income, and is sometimes described as the largest joint-stock railroad corporation in the world.

In round figures $5,000,000,000 have been sunk in the railway system of the United Kingdom. Were the British government to buy up the companies' properties as going concerns, the price fixed would probably exceed that sum.

The London and North Western has its own steel-works, situated at Crewe. These works are capable of producing 50,000 tons of steel a year. The company also owns its own rail-rolling mills.

London—the traffic center of the United Kingdom—has no fewer than nine main systems of railroads radiating from it, without counting the local and electric railroads.

There are seven hundred railroad stations in the area known as "Greater London."

Prior to 1872 the general practise of English railroads was to convey only first and second-class passengers by the fast expresses.

In April, 1872, the Midland Company adopted the policy of carrying the third-class passengers on fast trains. The competing companies followed suit.

Before the war the locomotives of the London and North Western were running upward of 72,000,000 miles a year, which is equal in total distance covered to a journey round the world every three hours; to the moon in twenty-nine hours, and to the sun every fifteen months.

Scooping water "on the fly" was first introduced by Mr. Ramsbottom, the locomotive superintendent of the London and North Western. His first experiment was about fifty years ago.

The first electric telegraph for every-day purposes was erected in 1838 between Paddington and West Drayton on the Great Western. The wires were first placed in tubes, but were afterward placed on posts.

In 1840 the London and Blackwall Railroad was opened. The trains were hauled by rope-traction instead of locomotives. Trains had to start from all stations simultaneously, and in order to inform the engineer of the cable engine that all were

ready the electric telegraph system was installed.

In 1870 the British government took over the telegraph system of the United Kingdom. The wires necessary for railroad operation were handed over to railroad companies and the others reserved for the use of the post-office.

The block system was first put into operation by Cooke & Wheatstone on the Norwich and Yarmouth Railroad in 1844.

Dining-cars were first introduced by the Great Northern on its London-Leeds service in November, 1879.

The "lock-and-block" system, whereby semaphores and switches are electrically interlocked with the telegraph instruments, was first given a try-out about thirty years ago on the London, Chatham and Dover Railroad by W. R. Sykes.

Nearly all the leading English companies have adopted the electro-pneumatic system of operating signals and switches.

The Great Eastern holds a record in having provided 226 breakfasts for an excursion party on board the Harwich Boat express. The guests were served in two relays.

The worst Christmas for English railroads was in 1891. The fog was so thick that flagmen could not see semaphore lights at twenty feet distance. All passenger-trains were anything from one to three hours late, and most of the freight trains never reached their destinations. The fog lasted four days and completely disorganized the railroads.

THE MOTOR.

BY ROBERT D. LUKENS.

I ANNIHILATE space and laugh at the grades
That harried the engine of steam;
My strength is the strength of the Titans—
Yet once they called me a dream!

As I pass you by I am singing
In measured meter and verse
A song that is sung by the stars in space—
The song of the universe.

This power of mine is a wonderful thing;
It toils with never a sound.
Yet it turns my wheels and moves my train
As it fights its way to the ground.

No fireman toils with a shovel
To feed an insatiable fire;
I reach up my arm of copper and steel
And take my food from a wire.

Oh, mine is the power that comes from the sun;
The force that will supersede steam.
My strength is the strength of the Titans—
Yet once they called me a dream!

With the Inventors

THE INVENTIVE TYPE OF MAN.

IS there a standard type of inventor? Is there a general class of human beings that can always be relied upon to do the work of an inventor and do it well?

One day a wild-eyed individual entered a railway station and proclaimed himself the inventor of a new style of ticket that would punch itself, sell itself, and do away with ticket agents. The agent, of course, did not fancy any such invention and had the man committed to an asylum.

That is only one type of inventor, and he forms an insignificant minority, and yet he is often pointed out as if constituting something more than the exception. The man was insane, of course, but if he had not gone mad over inventions then some other subject would have claimed the victim.

Love and the lack of it, riches and poverty, religion and atheism, all have claimed their victims. The fault or misfortune is in the victim himself rather than in any potency of the immediate cause. We can discard the imbecile as most certainly not being the standard type of inventor.

One of the peculiarities of invention is the fact that a man with no apparent training will frequently startle experts by devising something which they had utterly failed to produce. A physician will invent a new sole for shoes, and again the cobbler will devise a surgical instrument that will make possible operations never before successfully attempted.

The explanation of these examples is that the average business and professional men keep their noses so close to the grindstone that they can think only in terms of routine work. The condition is similar to that of the chess player so engrossed in the game that he cannot see a brilliant move which a casual spectator takes in at a glance.

If there is such a thing as a type of inventor, the type extends over and through every walk and profession and business in life. The law, the ministry, engineering in its various branches, and the host of others, all produce their quota of inventors each month, as regularly as the months come around.

There are certain qualities, however, which an inventor should possess, and in that sense a type may be said to exist. The inventor must have patience, for example. He must have curiosity, not of the mere idle and unintellectual variety, but an earnest desire to know the conclusion of a line of thought or the outcome of an experiment.

He must have the power of endurance, or else he cannot hope to stand the strain of long hours of toil and thought that are essential to success. He must have intelligence and be a correct and logical thinker.

Given these and other essential qualities, we can construct in our minds, as it were, a certain type of man known as the inventor. It is a type made up of characteristics rather than of nationality or appearance or special occupation. It is an honorable type and a useful one, and upon it must the human race rest its hope for progress.

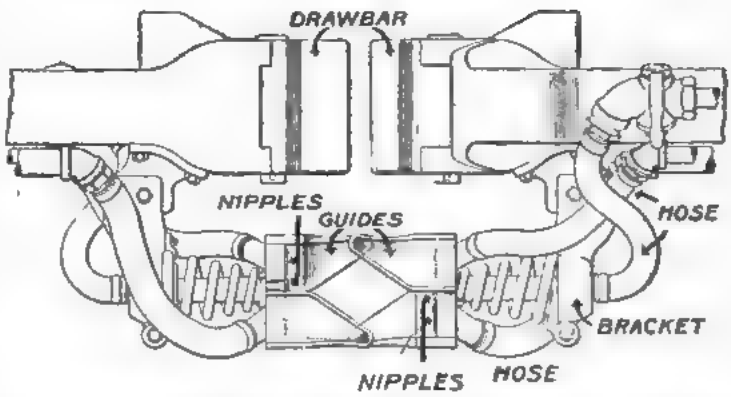
TRAIN-PIPE COUPLING.

A TRAIN PIPE coupling, entirely automatic in its action, is the invention of J. V. Robinson, of Branford, Connecticut, patent 1,245,772.

The illustration shows the coupling in the position it occupies when two cars are just coming together. The guides are coming into contact, and will bring the opposing pipe nipples together when the draw-bars are completely coupled.

When this has taken place, the tapered compression springs will force the pipe-nipples firmly together in a flexible connection. A peculiarity of these springs is that not only do they taper toward the front ends, but the wire itself diminishes in diameter, increasing the flexibility and preventing the bases of the coils from assuming a permanent set

Support for the pipe-coupling is provided by a bracket attached to the draw-bar and having a socket-joint at the point where the long, central nipple passes through, thus allowing for free movement.



THE GUIDES ARE COMING INTO CONTACT AND WILL BRING THE OPPOSING PIPE NIPPLES TOGETHER WHEN THE DRAW-BARS ARE COMPLETELY COUPLED.

MESSAGE TO TRAIN.

A REGISTERING device by James R. Little, of Moline, Illinois, enables the operator to tell the exact location of a train, and also enables him to signal the train to stop and receive orders and messages. The patent number is 1,243,535.

Semaphores located at the various blocks along the route are provided with telephones connecting with the stations. The dropping of the semaphore-arm indicates that the train is to stop and receive orders. The station apparatus not only regulates the semaphore-arms, but also has a dial that indicates the last block that the train has passed.

The operation of the locating dial is effected by a push-button that contacts with the wheels of a passing train. This transmits current back to the station and advances the dial indicator one notch for each block passed. The operator can then move the semaphore-arm at the block ahead of the train

In this way, a mix-up in train-orders can be readily straightened out and amended, and additional orders can be given as the train proceeds on its way. The invention consists not only in the idea itself, but in the novel and improved electromagnetic apparatus and devices employed in carrying out the idea

Although theory is considerably in advance of present railroad practise, there can be no doubt that inventors are laying an important groundwork for actual operation in the future, and that the many excellent safety devices being perfected will decrease accidents more and more as time goes on.

ROLLED METAL CAR-WHEELS.

LOUIS F. DIETER, of Buffalo, New York, is the inventor of machinery and a complete system for rolling car-wheels that are integral or formed in one piece. The patent, which is No. 1,246,067, is an extension of patents previously applied for by the same inventor.

One object of the invention is to produce a wheel in which the marginal or rim portion is compressed to a greater density than the web and hub The inventor claims that the rim is more durable and truer than in wheels hitherto produced

The wheels are formed in one heat, with all the surfaces smooth and all angles sharp and free from fins or other undesirable projecting parts. Machining off projections is an expensive process, and therefore the present method cheapens the production

The wheel is completely rolled and finished from a blank or ingot, and when finished is not only free from superfluous metal, but is alleged to have no undesirable internal stresses and strains. Moreover, the process produces extra strength where it is most needed, at the rim and the root of the flange.

Not only is the wheel rolled and formed during the one heat, but the hub is also pierced or punched. The process is said to result in a great saving in the cost of operations during manufacture, and the output is greatly increased.

TRACK-LAYING CAR.

PATENT No. 1,243,188, granted to W. T. Krausch, of La Grange, Illinois, and E. F. Weber, of Chicago, represents an improvement in track-laying cars adapted for handling and laying rails in position on the ties at a point in advance of the car, which is suited for movement back and forth on the tracks thus placed. The loose or unlaid rails are previously distributed along the roadbed where they can be readily picked up and swung into position

The idea has been to make the construction and operation so simple that one person can manage both the locomotive and the track-laying mechanism. When we consider the time and labor usually expended by a gang engaged in this class

of work, the conclusion is easily reached that such a machine economically operated ought to be quite a labor-saving proposition.

The motive-power may be any standard type of internal combustion engine, which operates a shaft running longitudinally along the center of the car, terminating in a bevel gear for transmitting rotary motion to the drive-wheels. This is accomplished through two other bevel gears rotating in opposite directions and constantly in mesh with the first gear, two friction clutches being used to effect movement of the car either forward or backward.

Friction cones, also located on the central shaft, serve to transmit power to a windlass which, in connection with a mast and boom, provide the lifting mechanism for raising the rails and placing them in position on the ties.

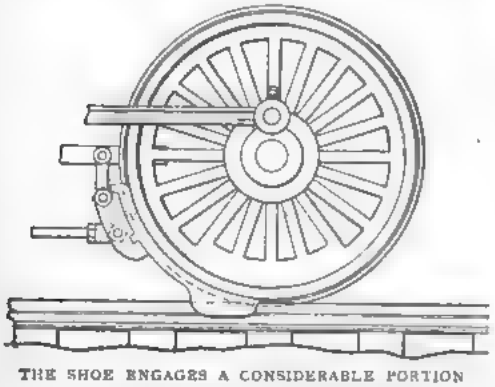
WHEEL AND TRACK BRAKE.

INVENTORS seem to be at work on the problem of applying the brake to the track, but without discarding the old idea of braking the wheel. A device constructed on these lines has been brought out by W. G. L. Totten, of Buckhannon, West Virginia; patent No. 1,245,824.

The object of the design has been to provide a brake-shoe of simple and durable structure adapted for use in either a locomotive or a car-truck. The shoe engages a considerable portion of the wheel, and extends from the block to the track. A flange on either side of the shoe prevents derailing.

When the brakes are applied, the shoe grinds upon the wheel in the usual way, and at the same time the bottom portion of the shoe passes beneath the wheel, lifting it entirely free of the rail. This prevents the grinding of flat places on the tire, which sometimes occurs when the ordinary brakes are applied with sufficient force to stop the revolution of the wheel, allowing it to slide along the track.

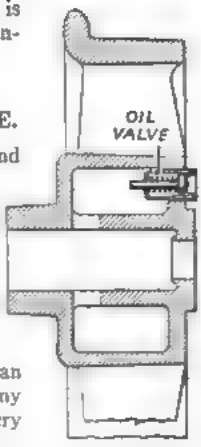
The problems involved in this invention have been occupying the minds of railroad men for several years, and the proper solutions now seem to be forthcoming. This is but the usual outcome of such matters. There is no problem too hard for the inventors.



THE SHOE ENGAGES A CONSIDERABLE PORTION OF THE WHEEL AND EXTENDS FROM THE BLOCK TO THE TRACK

IMPROVED OIL-VALVE.

THE American Car and Foundry Company, St. Louis, Missouri, has acquired patent No. 1,244,753, an improved oil valve, from W. J. McDonald, of Huntington, West Virginia.



THE OIL-CAN TIP IS PRESSED AGAINST THE VALVE-STEM, WHICH YIELDS AND PERMITS THE OIL TO ENTER

In the illustration the valve is attached to the wheel of a mining-car, but can be used on various parts of any locomotive or other machinery where easy access is desired.

The valve-casing is cast in one piece, and from the shape you will wonder how the stem and valve-spring are placed inside. The manner becomes clear enough, however, when one understands that the rear part of the casing is bent down after the stem and spring are inserted. This bending process is made possible by using an extremely malleable variety of cast iron.

The valve is compact, and resembles very much the ordinary air-valve of a bicycle tire. The threaded portion is slightly larger than the ends, so that the casing can be screwed in any desired distance.

The head of the valve-stem is in the form of a hemisphere and is self-centering. The adjustment is therefore very simple and not readily upset.

In using the device, the oil-can tip is merely pressed against the valve-stem, which yields and permits the oil to enter. On the withdrawal of the oil can the valve closes automatically and keeps out all dust.

The construction and operation of this valve are so simple that some may wonder why we take the trouble to notice the device at all. The very simplicity of the invention, however, is what gained a market for it. There are many very much more complicated valves that failed to find a market. There is money in the right kind of inventions.

SAFETY SWITCH.

IN the early days of railroading it was the custom to derail a train that approached another on an intersecting track. The man in the switch-tower simply moved his lever and opened the switch in front of the last train to arrive on the scene, and gave it an open track toward the nearest ditch.

That was an easy way to solve the problems involved, and yet the method often proved expensive. A train derailed, even when running at a moderate speed, frequently cost considerable

money before it was thoroughly repaired and on the rails again.

It is strange that people in those days did not see the advantage of running the train on a siding instead of into a ditch

To-day that is all changed. There can be no doubt about the advantages of the side-tracking method, and inventions of such a character are brought out every now and then Of this type is patent No. 1,245,075, procured by Franciszek Warzecha, of Bay City, Michigan.

This switch is automatic in its action, trip-bars being placed beside the track to be depressed by the wheels of a passing locomotive. A system of levers throws the switch of the intersecting line and side-tracks any approaching train. That gives the engineer of the side-tracked train time to apply the brakes and effect a stoppage.

If the engineer fails to apply the brakes, there is no particular provision in this particular patent. Possibly it could be used in connection with one of the familiar train-stopping devices that have been patented within recent months.

The two ideas thus combined ought to be efficient. Of course a train-stop alone would answer the purpose, but there are crossings where it is not desirable to stop a train until it is run onto a siding and out of the way.

DON'T ASK FOR ADVICE.

THIS department does no more than describe patents already taken out and occasionally suggest new developments. *We can't pass on the merits of inventions, whether patented or only projected.*

THE WELL-DRILL.

BY LYDIA M. DUNHAM O'NEIL.

I AM the well-drill! Mighty is my power!
Deep I burrow in the earth, and deeper every hour.
Watch the weighty drill-bar! Watch the swinging jars!
They have pierced the heart of earth and they have left their scars.
Through sandstone or limestone, chalk or yellow clay,
Three thousand pounds of toughened steel drive their stubborn way,
Down through the darkness and the silence under ground,
Deeper, ever deeper, with a steady, muffled pound.

I am the well-drill! Listen to my drone!
More I know of earth than all the men of earth have known.
Tertiary, secondary strata—what are they?
Pulseless piles of lifeless matter that would bar my way!
Wind-caves, seep-caves, boulders loosely hung,
Gyp rock, granite rock, round me closely clung,
Seize me, and hold me, till my swinging jars
Fling me from their clutches free—brave auxiliars!

Greensands, quicksands, greedy, groping, blind,
Choke me till I burrow deeper, leaving them behind.
Pliocene—eocene—ancient lava-bed;
Crystals, or fossils a million eons dead.
Deeper, deeper downward the drill-bar drums,
Till the living water upward-gushing comes!
Steel and water met at last—mighty is their power!
I am the well-drill, and this my winning hour!

FREAKS OF THE IRON HIGHWAY.

All Sorts of Queer Contraptions Now Seen Pounding the Tracks, Just as in the Old Days.

BY J. W. GREENBERG.

WAY back in the early days, long before railroad people were worried by ties, Interstate Commerce Commissioners and other inconveniences, the railroads really were private property. Not private to a few bloated plutocrats called stockholders, mind you, but the individual and personal stamping-ground of plain people like you and—well; yes, if you insist—me.

So in those days, if you wanted to cart a barrel of flour to your Aunt Maria, you got out your buggy, hitched up the old nag, drove over to the right-of-way, and started merrily down the tracks.

When the old hay-burner or wood-burner or whatever it was that happened to be acting as motive-power for the passenger traffic came tooting along and the engineer rang his bell, you simply got off the tracks, bade him "good morning" as he passed, and straightway climbed back on the tracks again.

You see, the tracks were there only for the convenience of people who wanted to avoid the discomforts of traveling along miserable roads. There wasn't any question of your right to be there, and the particular sort of vehicle you chose to drive or pull or shunt along the iron was of even less concern

Whether it was a hayrack or a tricycle or some weird contraption of your own invention was nobody's business particularly. People weren't educated up to standard gages, standard cars, standard locomotives and standard everything else. The right-of-way was, in fact, an interesting place in Aunt Maria's time, for you never quite knew just what sort of a conveyance was coming along next

All of which is simply by way of pointing out how the old adage about history repeating itself is just as true of railroad as of any other sort of history. For once more we are beginning

BY RUNNING HIS MOTOR-CYCLE ALONG THE RAILROAD TRACKS THIS ENERGETIC DOMINIE OF THE NORTHWEST MANAGES TO PREACH IN THREE TOWNS EVERY SUNDAY

to see all sorts of strange devices pounding along the iron in America, running "wild" or "smoking in" against everything.

As freak Number One, take a look at the motor-cycling missionary. That is, the motor-cycle is the freak, not the missionary, God bless him.

Far up in the northwest country he lives and works, in a region where the communities are far apart, and the connecting roads far from what even the most optimistic maintenance-of-way engineer would call good. There this pioneer dominie preaches the gospel to the congregations of three churches, situated in widely separated villages.

During the summer months he is able to reach all three churches in a single Sunday by racing from town to town on his motor-cycle. But during the spring when the roads are wet and heavy with mud, and in the winter when the snow lies deep on the highway, it is almost impossible.

However, the sturdy young minister was not to be beaten thus easily by the elements. His work had to go on.

So he conceived the plan of fitting a side-car to his machine, with the axle extended so that the wheels would take the broad-gage railroad tracks. Then he removed the tires from the front wheel of his motor-cycle and a wheel from the side-car. The groove took the rail-heads very neatly, and he found that he was able to spin along the tracks at a good pace, regardless of weather conditions.

Often when the weather is much too severe for a long trip on the roads this young minister may be seen speeding along the right-of-way to one of his three churches, and sometimes he carries a passenger in the side-car. He has mastered the schedules of trains on that division and has made a schedule for his own runs accordingly.

Bundled in heavy woolen garments, and wearing a fur cap over his ears, he looks very different from the conventional preacher, but that is the sort of minister the rugged settlers of the northwest country like.

If the boys riding the flat-car in the second picture were anything like the boys of less than a generation ago, they were doubtless yelling, "Get a horse!" And that is pretty near what the lumber company that owns this outfit does in transporting men and supplies between their plant at Elk, California, and logging-camp, twenty miles distant. Except that the motive-power employed in this case is a ninety horse-power automobile.

The road is narrow-gaged and has curves up to fifty degrees, with 1,500 feet of four per cent grade, and 3,500 feet of three per cent, nearing the summit. The rest varies from one and a half to two per cent all the way.

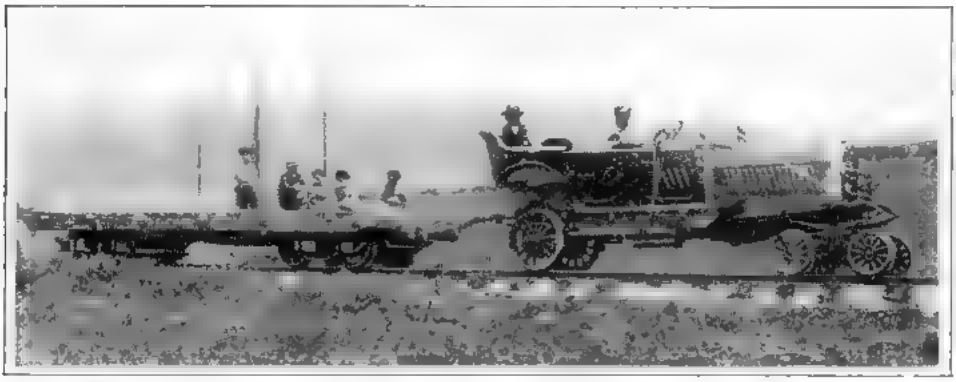
The machine is an ordinary touring-car, fitted with locomotive tires and a pony truck in front to enable her to make the curves. Standard railroad brakes have been applied to all the wheels, the steering-wheel being used to operate the brakes on the front truck.

There's been a whole lot of talk in recent years about automobiles of one sort or another making incursions in the railroad field, with the possibility of supplanting trains altogether. Well, none of us are really afraid of that happening for a while, and, anyway, this is no place to argue about it—simply to record as a fact that the great motor-bus in the third photo that comes lumbering along the iron daily on the tracks of the Virginia and Truckee Railway is creating considerable comment among the good people of the far West.

Almost on every trip it is crowded to capacity while on its run between Reno and Virginia City, Nevada. It gives fast service, and charges less for the trip than the regular train.

Uncle Sam is the offender guilty of Outrage Number Four. So eager is he to employ the very latest and most efficient methods in all branches of his business, that he has equipped his United States Coast and Geodetic Survey with an adding-machine mounted on a motor-propelled velocipede.

Instead of having the surveyor slowly jot down his pole readings in a note-book, as was formerly the custom, that individual now pounds them out on his adding-machine as he rides along. The work proceeds with



DEMONSTRATING HOW A CALIFORNIA LUMBER COMPANY TOTES MEN AND SUPPLIES FROM ITS LOGGING-CAMP TO ITS PLANT, A DISTANCE OF TWENTY MILES

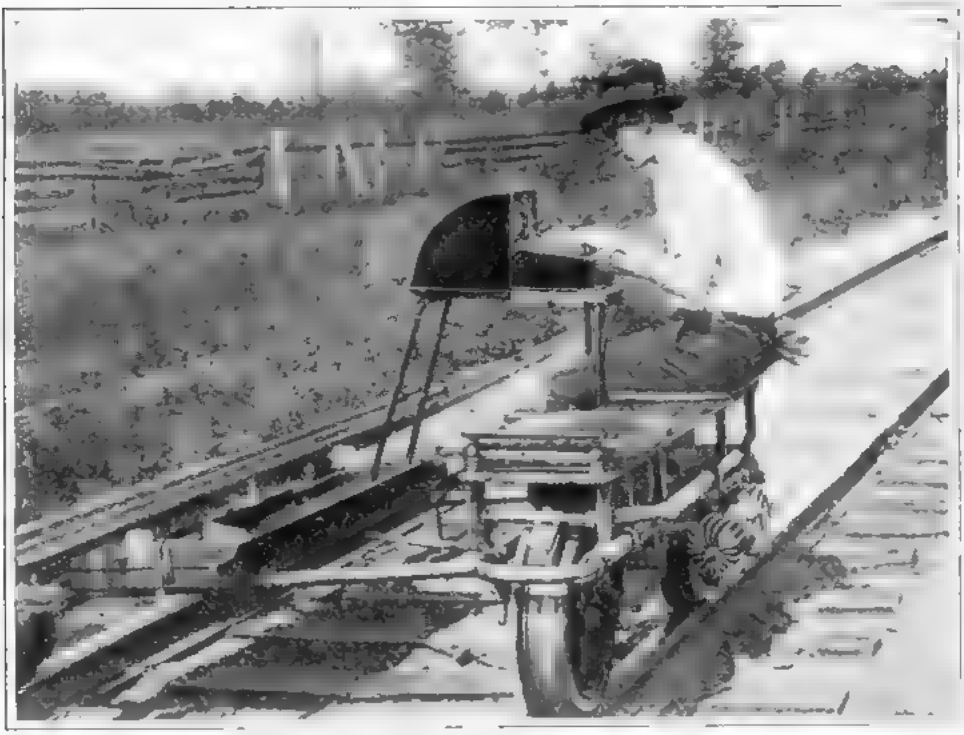
speed and precision and totals are secured quickly.

This system is used by field parties of the survey who are engaged in leveling, most of the work being done along the right-of way of the railroads. At short intervals sights are taken, both forward and backward, and the two sets are recorded in order to check their accuracy.

At the end of a section the totals of both sets are secured by the machine and by subtraction the difference in elevation between the two bench marks is ascertained The adding-machine is mounted on the speeder by means of a frame bolted to the body, which it is unnecessary to detach in making runs from place to place.

Whatever the innovations in mechanical devices, it seems to be assured that the horse will stay on forever. And even in

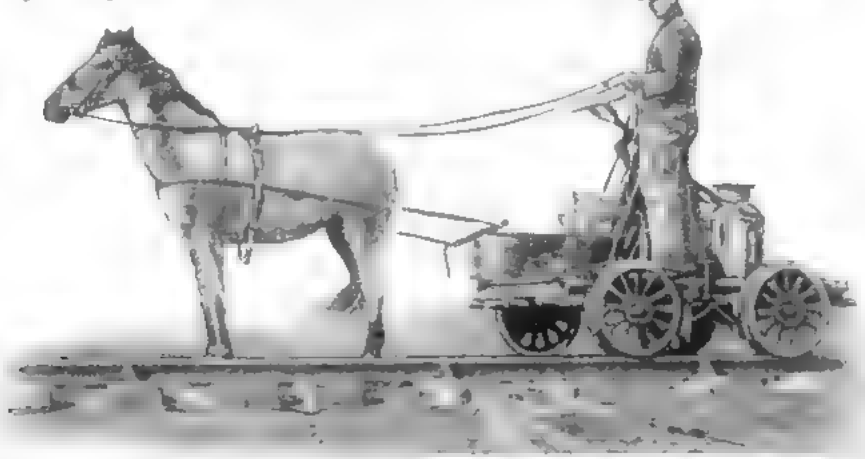
ANOTHER INSTANCE OF HOW IMPORTANT A PIECE OF RAILROAD ROLLING-STOCK THE AUTO IS COMING TO BE SHALL WE SEE THE DAY WHEN THE ROUNDHOUSE GIVES WAY TO THE GARAGE?



WHEREIN THE U. S. GOVERNMENT USURPS THE RIGHT-OF-WAY TO SEND ITS SURVEYORS OUT ON SPEEDERS TO WHICH ARE ATTACHED ADDING MACHINES SO THAT THEY MAY WORK AS THEY RIDE

the railroad game he has his place, judging by the novel use to which one section foreman on a heavy grade branch line of the Northern Pacific Railroad in North Dakota put his bronco.

When the war came along and put men at a premium, the aforesaid foreman, whose picture you may see in this last cut solved the labor shortage difficulty easily enough by loading his supplies onto the old hand-car and hitching his horse to it. There being little traffic along this particular division he was able to make excellent time in covering his territory without considerable interruption by means of this new kink in railroading



WHEN THIS SECTION FOREMAN FOUND THAT LABOR WAS SCARCE AND HE COULDN'T GET ANY ONE TO OPERATE HIS HAND-CAR, HE CONCEIVED THE NOVEL IDEA OF PRESSING INTO SERVICE A BRONCO THAT WASN'T DOING ANYTHING BUT EATING ITS HEAD OFF

The Sunny Side of the Track

A HIGHLANDER from Tobermory asked at the Aban railway station the price of a ticket to Killin.

"So much," replied the clerk.

"Hoot awa'," replied Donald; "it's far ower dear. I'd rather walk!" and off he started.

He had not proceeded far when the train came tearing along, whistling as it neared a station.

"Ye needna whistle for me!" said Donald. "I made ye an offer ainee, and ye wadna tak' it; sae ye-can gang on. I'm no comin'."

—*Canadian Magazine.*

IT had rained all afternoon and the streets were crowded! The street-car came along, stopped, and as the people piled on, the fellow and the pretty girl followed them. They reached the platform.

"Do you think we can squeeze in here, Jane?" he asked.

"Why, Dick, of course not! Wait till we get home"—*Ohio State University Sun Dial.*

ONE day recently an elderly farmer drove into town and hitched his team to a telegraph-post

"Here,' yelled a policeman; "you can't hitch there'"

"Can't hitch! Why not?" shouted the farmer. "Why have you got that sign up, then, 'Fine for hitching' ?"—*Exchange.*

THE File-Clerk: "That young college student is some puffed up over joining the Katy"

The Bill-Clerk: "Aw, he thinks the Katy joined him."

—*M. K. and T. Employees' Magazine.*

THE superintendent wheeled his chair around and pushed a button in the wall. The chief clerk entered.

"Here," said the superintendent, "are a number of directions from outsiders as to the best way to run a railroad. See that they are all carried out."

And the chief clerk, gathering them all into a large waste-basket, did so.

—*The Scenic Line's Employees' Magazine.*

EMELINE was watching men working a pile-driver, and came to her mother with the complaint:

"I'm so sorry for those men, mama; they've been trying and trying to lift out that big weight, and every time they get it 'most to the top it falls back again."—*Exchange.*

"I HAVE a plan to relieve the paper shortage at a stroke."

"Huh?"

"No railroad ticket to be over one yard in length."—*Railroad Men.*

STRANDED Passenger: "Who's that singing in there?"

Boy: "That's the stationmaster—'e's got so little to do now, there ain't any more trains stop 'ere, so 'e's settin' the time-table to music for the porters to learn when they come back from the war'" *London Opinion.*

GENT "Is there any soup on the bill of fare?"

Waiter: "There was, sir, but I wiped it off."—*California Pelican.*

"MY mother always told me that in taking you I was marrying beneath my station."

"Beneath your station, eh? That wasn't a station your family had; it was just a water-tank."—*Detroit Free Press.*

WIFE (at breakfast): "Oh, John, I'll bet I know who you gave your seat to coming home in the car last night."

Hub (who had been out having a quiet little game): "Nonsense, my dear! How could you even guess? How do you know I gave my seat to anyone?"

Wife: "Yes, you did. You dear, kind old boy; you let a poor old Irishman have it, for I distinctly heard you say in your sleep, 'Oh, that's all right; I'll stand pat.'"—*H. and M. Review.*

IRVIN COBB was on a Boston trolley, riding on the platform, standing next to the gate that protected passengers from cars coming on the other track. A Boston lady came to the door of the car, and, as it stopped, started toward the gate, which was hidden from her by the men standing before it.

"Other side, please, lady," said the conductor

He was ignored as only a born-and-bred Bostonian can ignore a man. The lady took another step toward the gate.

"You must get off the other side," said the conductor

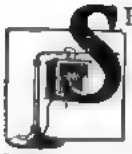
"I wish to get off on this side," came the answer in tones that congealed that official into momentary silence. Before he could explain or expostulate, Mr. Cobb came to his assistance.

"Turn your heads, gentlemen," Cobb remarked quietly. "The lady wishes to climb over the gate."—*New York World.*

RAIL STORIETTES AND THOUGHTLETS.

Work around Freight-House and Depot Is Not Unrelieved Monotony, as These Anecdotes Make Clear.

BY J. E. SMITH,
Author of the "Observations of a Country Station-Agent" series.



HE came to the freight-house office and stood tentatively at the counter to be waited on.

Only now and then a woman appears at the freight-house counter. The average morning run is one of truckmen and draymen treading on the heels of one another and lifting their freight-bills.

The lady was of gentle bearing. She carried an air of refinement and exclusiveness as being far removed from the rabble about her.

The chief clerk gave respectful attention.

Wanted to "Charter a Car."

"I wish," said she with a touch of caution, "to ship my household goods to Oxford. I want some information. How much will it cost us to charter a car?"

Every one who ships household effects puts it that way to the freight-house clerks. They all want to "charter a car." Any kind of freight can be moved in carload lots, but the clerks who know the minutiæ of the freight business know there is no such thing as "chartering a car."

The term is not used in speaking of other kind of freight. But any one who ships household goods in carload lots flatters himself that he has "chartered a car." I do not know how the phrase originated or how it came to be attached to household goods in carload lots. Will not some one explain?

To return to the lady.

She explained that she had quite a quantity of furniture, enough in fact for an eight or ten room house. There was the grand piano, to say nothing of various other massive pieces. It would take a car, a large car at that.

The rate-clerk then came forward with the necessary information that if the household goods went at less than car-load, it would take first-class rate at so much per cwt. But if the lady shipped a full carload, it would go second-class rate, which was cheaper.

Goods Had to Travel First Class.

"We are not well acquainted in the place where we are moving," explained the lady. "First appearances and how one arrives, have a great deal to do with the impression one makes and how one is received. I think we should take the car, but we cannot go second class.

"I knew a gentleman who traveled from Denver second class and they would not let him occupy a sleeper. It was very humiliating, indeed. No, decidedly, I do not want the goods to go second class even to get a car. Really I must insist on the first-class rate."

The bill-clerk made the best explanation he could that never, never had there been any social distinction in freight rates, and that the schedule of rates only bore these handy numerical distinctions to separate and define the service.

How clear he made himself is evident in that the trucking company delivered them, and billed them out L. C. L., with the first-class rate noted in the proper space, where all concerned might note.

In these times of close discernment and discrimination in our social relationships,

the lady took no chances. She moved first class.

Suppose the goods had gone carload, second class, and it had gotten whispered about! Think what the lady would have had to live down!

Christmas Mellowed Tim the Foreman.

We come now to one Tim Casey, foreman of Section 27.

It was the day before Christmas, and Tim's heart was mellow.

"I was thinkin', Manogue," said Casey as they put the car in the hand-car house after the day's work, "to-morrow's Christmas agin, and nothin' doin' for you and Haggarty. And nothin' for me but to walk over the track and come home and eat goose. We're havin' goose, Manogue."

"We're havin' two rabbits," countered Manogue.

"It's feast day and gift day," Casey went on, ignoring Manogue, "and friendly feelin' everywhere. Everybody will be givin' everybody something they can't afford and what nobody wants.

"I'm off this givin' stuff, Manogue. I'm agin them useful things that don't match and won't fit, Haggarty."

"It's all right, Casey," replied Manogue softly. "It's all right with Haggarty and me. We ain't askin' for nothin', and we ain't arguing with you about it.

"Haggarty was a thinkin' that you might get him a pick with a rosewood handle and I was kind of expectin' an aluminum shovel, but—oh well; it's nix mox ox, which is Chinese for aber nit.

"We got nothin' ag'in' you, Casey. If you feel like tightening up, we are for you. But would you mind givin' me a pipeful?"

Casey produced a tin of scrap and Manogue and Haggarty lit up.

A New Yuletide Stunt.

"I thought of it yesterday," continued Casey. "It ain't buyin' things that fills the heart with beautiful sentiments. It's somethin' you do or say that shows how much you love or are thinkin' of the dear ones. To-morrow I am goin' to Central and call up my brother Denny."

"Where's Denny now?" asked Manogue.

"Denny's in Gary," replied Casey. "He's in the steel-mill a bossin' a gang. I'll call him up over long-distance, and when he says "Hello," I'll say:

"'Hello, Denny! Guess who this is; and how's you, Denny? Merry Christmas; and how's everything comin', Denny?'"

"I haven't seen Denny for three years, and he'll sure be surprised to hear my voice. It'll be same as a visit. Ain't that better than sendin' him a pair o' socks by parcel-post with the string all untied and the wrappin'-paper off? Eh?"

"Wot it'll cost you?" asked Manogue dubiously.

"Sposin' it costs a dollar; what's the odds? Who wouldn't pay a dollar to have a talk with a brother he hain't seen for three years. Ain't hearin' his voice once more better 'an neckties, galluses or socks?"

"Call for Mr. Casey!"

Around nine o'clock Christmas morning a call went over the wire across the valley of the Kankakee to Gary to single out and put up one Denny Casey, a foreman of the steel-mills, to talk with a far-off town to one Tim Casey, foreman of Section 27.

Tim Casey at Central sat in a stuffy booth in all the horrors of a dress-up suit and awaited the signal to speak out.

There was a long wait and a number of false alarms, but at last the voice of the telephone operator cried out with a spooky shriek:

"There you are! There's your party at Gary!"

Tim scraped and hawked to clear his throat, then yelled into the telephone:

"Hullo! Hullo!"

Then louder:

"Hullo! Hullo!"

Still more explosive:

"Hullo! Denny! Denny! Hullo! Is it you, Denny? Hullo! Is it you, Denny? Hullo!"

Casey gripped the receiver as if it were a claw-bar. Then he pitched an octave higher and shouted into the mouthpiece as if Denny were over in the next block:

"It's me! Is it you, Denny? Hullo! Hullo! It's me. Is it— Hullo! It's me— Hullo! Hullo!"

There was a sudden click or clamp in the ear-piece and Casey came up with a start.

"Wot was that? Did the mill blow up? Did you hear me, Denny? Hullo! It's me! Hullo! H-u-l-l-o! Is it you, Denny? Can't you hear me? It's Tim! Tim! T-i-m!

"Wot? Wot? Do you git me? Come in closeter! Speak louder! Hullo, Denny!

"It's me, Tim! T-i-m! Is it you, Denny? I say, is it you? Is it—"

Casey paused a moment for breath. He could hear a far-away voice straining through the whir-r-r and click and cracking of the wires. It came through thin and fragmentary. He thought he heard:

"It's me. Well, speak up. What the divil you want inyhow?"

Thereupon Tim squared away and resumed with vigor:

"It's me—Tim! Tim Casey! Is it you, Denny? How are you, Denny? I say, how are you, Denny?

"Are you there, Denny? Are you dead or alive, Denny? Wot? I say, wot? How's that?

He Couldn't Hear for the Noise.

"Me! M-e, Tim! Speak louder! I don't git it. Me! Yes!

"I say, how's you, Denny? I can't hear you.

"They's so much noise! It must be the machinery in the mill. I can hear the wheels goin' round and the hammer.

"Come closeter. I say, how are you, Denny? I say—h-o-w a-r-e y-o-u, Denny? Blast it! H-o-w a-r-e—I say—Wot? Wot's that? It's me—Tim—"

The veins stood out on Casey's forehead and he wiped his sweat-covered face. Then he went at it again:

"I say, Denny—Denny! I'm callin' you up, Denny! Nawthin's the matter. Nawthin'! Nawthin'! I'm callin' you up because it's Christmas! Because it's Christmas! C h-r-i-s-t-m-a-s! Hell! Christmas!"

Casey was now yelling like an auctioneer.

"I can't hear you. I say I can't hear you. Come in closeter. Louder! It's me. Wot? Yes, me. Hullo! H-u-l-l-o!"

Then there was a silence, and nothing more came from the direction of Gary.

Casey emptied more noise into the "phone" but nothing came back. At last he hung up and staggered out of the booth. He was breathing hard, his face was fiery and his collar was unbuttoned.

$2.10 for a Little Talk.

An obliging girl clerk took his five-dollar bill, did a little figuring, and returned him two dollars and ninety cents

Casey counted it over and went into convulsions.

This brought out a brisk young man, and who informed Casey that no ultimatums or war stuff went, that two dollars and ten cents was the right charge for the talk of twenty minutes plus, and that there, right there, was the exit.

In a brisk, businesslike manner he hurried out to point the way at close range and expedite Casey's going. Probably he made too many gestures. Probably Casey was not so full of Christmas spirit as he thought he was.

Probably—well, anyway Casey did not need any help. He moved out with moderation and under his own steam. The girl clerk helped the young man up and through the office-railing entanglements, and did as well as a Red Cross nurse and an ambulance.

"I got a pair o' socks and Manogue got a pair of suspenders," said Haggarty the next morning. "The kids had a big time, but all of it ain't as fine as that happy thought of yourn, Casey. An' wasn't Denny surprised though? An' what did he say?"

"Denny's got a good job," replied Casey solemnly. "He said to give you and Manogue his best regards and Merry Christmas and a Happy New Year, and—lift a little there, Haggarty; and you, too, Manogue. I'm not heavin' this car around all by myself!"

Conductor Pat Wanted an Air-Ship Ride.

Conductor Pat Donovan, of the package local, asserted on many occasions and to many of his colaborers that he would never feel that his career had been rounded out until he had taken a ride on an air ship.

He had been in head-on and in tail-end collisions, had fallen off a box-car, and was

short two fingers as a reminder of that early exciting sport of pulling the pin as the slack was being taken up. Thus he had earned the right to be a candidate for further thrills.

Many of us carry with us some trifling wish, some small desire for some bit of adventure or by-play quite apart from the duties or pastimes that we perform daily, or that are within easy reach. Many think with pleasure of some enterprise that has an element of chance or hazard.

Pat Donovan thought he had not completed his full course of daring and rashness until he had taken one fly in an air-ship, and bumped his head on a cloud.

At the railroad man's picnic at Ashley's Park last fall Pat had his opportunity.

A birdman contributed to the entertainment by an ascent in a biplane.

He called for some railroad man to accompany him.

For some reason Pat did not rush forward. But kind, remembering friends pushed him into it.

Birdman Got His Goat.

"You'll have to strap yourself in," explained the airman *sotto voce*. "Don't get excited. Just hold tight and keep cool. I'm going to loop the loop, chute the chute, scoot the scoot and hump the bump. We are going five miles high and we are coming down with the whoop-the-whoop glide.

"The crowd's got to have its money's worth. If I didn't give the spiral twist and the cyclone whirl the crowd will be sore. I want to caution you, no matter how scared you get, don't move. Eh? What? Where you going?"

Pat had climbed out.

"Hold on, professor," he replied, edging off to the rear. "We've got to see if all the tail-lights are burning."

He did not stop.

"All right, professor; let her go!" he shouted. "Let her go! I'll go back and flag!"

An undersized and anemic mechanic from the shops took Pat's place. The plane did not go very high and there were no thrills. Pat watched it through from a safe distance.

"Hang it!" mused Pat. "The boys put up that job on me. They told that bird what to whisper to me."

Forever after Pat has been mum on the subject of aerial exploits.

Agent Mock Reverted to Type.

Putting the matter scientifically and after the fashion of Dr. Darwin, we shall state that Agent Mock was merely a victim of the natural law of reversion to type.

It is wonderfully interesting. Neglect a strawberry bed and the plant degenerates into the small, seedy strawberry of the woods. The fine double rose if given no further attention becomes the dogrose of the hedges. Man, noble man, will as sadly degenerate if left uncultivated.

Mock was partly civilized when the railroad sent him to Rabbit Run. He could then be picked out as a human being, subkingdom Vertebrata, order Bimana, class Mammalia.

But no one much lived in Rabbit Run. It was fading and wasting away. The depot was only a shack. Mock got under the spell of all this dwindle and dry-rot.

After three years as agent and in close communion with the natives he quit bathing, forgot to cut his hair, and allowed his whiskers to whisk.

The superintendent in passing took note of the general dilapidation. He wrote Agent Mock a letter to clean up and hinted that this applied not only to the premises but to the agent as well.

He stated further that the company's representatives were expected to present a clean and neat appearance in their contact and intercourse with the public.

Public Had Nothing on Him.

Agent Mock read the letter and tossed it into the coal-scuttle.

"The dod-rotted public has nothing on me," he mused. "If I'd doll up a bit and put on as much as two ounces of spruce these cave-dwellers and trough-eaters would cut me cold. I would be a social outcast. As long as I'm at Rabbit Run I'll be one of 'em."

Agent Mock answered the superintendent in these words:

I am glad to learn that you have taken note of the conditions at this station. Ever since I have been here I have been trying to get the depot painted. I am glad it is now to be done. There isn't any improvement in town needed more. It will take three coats.

This reply brought no response either epistolary or in the way of lead and pigment.

But on the next trip the superintendent noted not only the same old dirt and disorder but the fact that the agent himself was barefooted.

"I am going to fire that fellow!" exclaimed the superintendent with some warmth to the trainmaster. "He is getting worse. If he stays here another year he will be carrying a stone ax and have a bone through his nose. He will have to go, that's all there is to it."

There was nothing particularly against Mock, so far as his work was concerned, only plain degeneracy.

But on a second thought the superintendent did nothing rash. He wrote Mock another letter.

"Let This Be the Last Time—"

He called attention to his—Mock's—unkept appearance and bare feet. He was giving him—Mock—one more chance to clean up and dress up. If he—the superintendent—saw him—Mock—another time as slouchy and disheveled as heretofore, he would dismiss him from the company's service.

Two weeks later the superintendent went over the road on an inspection trip.

"Rabbit Run is our next stop," remarked the superintendent to the trainmaster. "We shall stop long enough there for me to inform our man that he does not belong to us any further. He is hopeless, and I shall pry him loose while the spectacle of disorder is before me. He is the only caveman we have."

It was in his mind to "fire" Mock spectacularly. The special stopped and he got out of the coach and gave a hurried look about the premises for the intended victim.

Agent Mock was not in sight, nor was he in his office. A great change had taken place. Everything was tidied up. The windows were shiny and clear, showing a vacant office

The superintendent was agreeably surprised. Still expecting Agent Mock to turn up, emerge or appear, he all at once became aware of a stranger standing in stiff military attitude near the waiting-room door. He was faultlessly attired in a full-dress suit. He had a white waistcoat and kid gloves. In each hand he held a fine bouquet of flowers.

Some Class! Some Class!

He stood in stiff attention, the very statue of dignity and formality. He had the bearing and aspect of a finished aristocrat. He was the classiest single human exhibit the superintendent had ever bumped into outside the most select functions.

By comparison the general assortment of small railroad officials that lumbered off the superintendent's coach looked like roughnecks and riffraff.

It was Mock.

He had been chastened and had taken heed

The superintendent was not devoid of humor, but he suppressed the impulse to let out a roar, and accepted the "comeback" with all seriousness. He congratulated Mock on the wonderful improvement all around.

Mock returned a formal "thank you," then called attention to his previous request that the depot be painted, adding that he himself had put in the geranium-bed and was training the lilacs over the coal-shed.

Later Mock was promoted to a better station. In getting back to civilization he made a hit.

The depot at Rabbit Run got its three coats. Clustered about it are flowers and shrubs, and passengers, glancing out as they go by, mark it as a pretty spot.

Tough Luck—That's All.

This was told to me as a true story. If that adds any value to it you are welcome.

It was hard luck. There can be no other name for it. Fate plays us these scurvy tricks from time to time.

Jim and Tom were on nights in the

operating department. As clerks they had much to do. In the railroad business it is often that way.

Duties pile upon duties. Details heap upon details in the unforeseen rushes of business.

At first the two clerks muttered, then growled, then yelped, then at last let out a concerto-ensemble-fortissimo roar for an additional clerk to help them out.

This wail of agony got to the superintendent's ears in the usual manner, but he was not immediately stirred by it. I have never known any superintendent to act on any sudden emotion or wild impulse on the first cry for clerical help

This one said he would think it over. All of them think it over. They balance it carefully.

They figure on the relation of expenses to the earnings, the per mill-per mile-per ton, the income in ratio to the outgo, and other such elaborating, correlating, coordinating details.

The Super Would "Think It Over."

The superintendent said he would think it over.

The boys had worked hard, no doubt of it; but for two or three nights there came a let-down, and the work broke easily for them. This uncertainty and variation in railroad work is one of its fascinations.

There was a tennis tournament at the park on the day in between these two light nights. The boys were in on it, so that they were pretty tired when they went to work in the evening.

It was a very light night, and by midnight the work was pretty well out of the way. They stretched out, same as you and I would have done. Jim took the top of the table and Tom settled down deep in the swivel chair with his feet resting in a half-open drawer.

They slept. In technical railroad lingo "they were in the hay." It was no fitful cat-nap, wherein the subconsciousness has dim knowledge or perception and stands guard against intrusion. It was the real forty mule-power slumberino, with hissing noises and vibrant exhausts delightfully rhythmed.

As We Were Saying—

Coming back where we started: It was hard luck. It was a most unholy hour for any superintendent to be prowling around, but this one happened in.

He casually remembered that the plea had been made for an additional clerk, and he thought he would look in and have a word with the weary and exhausted, the jaded and fatigued, the harassed and overworked clerks, each doing two men's work.

Perhaps it would not have been so bad, but they were going in different keys. The low G obligato profundo was intermitting discordantly with the soniferous treble.

The superintendent was fairly human. He did not arouse them. He sat down and wrote a note.

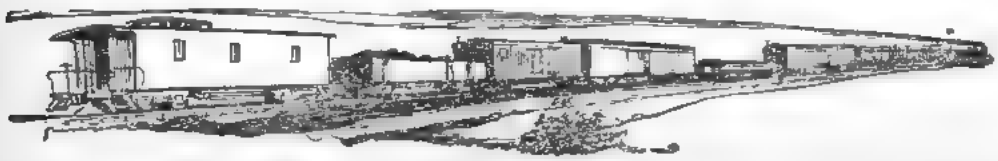
He said he had given careful consideration to their request for a third clerk, but in looking over the situation he could not see where the third man could sleep, as there were bunking-places for only two. He was sorry to find them in a state of collapse from overwork, but at present he could see no way to help them out.

Too Bad! Hard Lines!

It was the first night for many a month the boys had slept on the job, and many a night followed before there was another night so light.

It is fate. For has not every railroad man noted that all investigations and inspections on the railroad fall on the light and uncrowded periods, wherein the wrong impression is gathered?

Hard luck!



"ABOUT THIS, NOW, CAR-SHORTAGE."

"Needs Must When the Old Boy Drives," Hums the Shipper as He Schemes to Get His Freight Moved.

BY GEORGE GOODE.

A FEW years ago a young man from a Northern city came down to Louisiana and purchased a tract of land. A lumber company had cut out all the good timber.

With the land went a railroad about twenty miles in length. The road had been constructed to haul logs to the sawmill and was built up and down hill. There were few cuts or fills. The road owned one engine of the type of 1874 and about one hundred cars.

For several years the young man was compelled to operate this little piece of railroad, running one train a day. Sometimes the train carried several passengers; at other times the engineer and fireman, who was also conductor, brakeman, baggageman and train auditor, rode alone.

A Cagy Young Man, This.

Then came the war. The young man saw a year or so ahead, something that a great many didn't. He put men to work repairing the cars he had on hand. Before prices soared he purchased cars, and more cars, brought them to the end of his little road, repaired them, and then sat down to wait.

He didn't have to wait long. A congestion of freight at the Atlantic seaboard caused a call to come for his cars. He let a certain party in Detroit know that he had about two hundred good, standard-gage flat cars.

A man came down South, looked them over and rented fifty for a period of five years. Then another firm sent a man down and rented fifty more.

To-day the young man has every car he owns rented at a good figure. He kept one for his own road, to act as a sort of buffer between the decrepit locomotive and the antiquated passenger coach. The money for the rental of his freight-cars comes in and secures him a good income, regardless of whether his road pays expenses or not.

Motor-Car People Up Against It.

Everybody in the West has a motor-car if he or she can afford it, and many have cars who can't afford them. Still, the motor-car dealers are hundreds of orders behind. The factories had plenty of cars on hand and were making others as long as iron, steel and old tin cans were available, but it takes railway cars to transport motor-cars to the Middle West.

One Kansas City dealer watched his orders pile up and could get no cars. The railroads wouldn't promise any transportation facilities for the lowly motor-car until after the war was over.

"But the packers get all the cars they want!" the motor-car distributer expostulated.

"On the contrary," explained the freight-agent, "we have to furnish the packers with very few cars. Go down to any packing-house in the West Bottoms and you'll see they're loading very few railroad cars. They're all private cars.

"You'll see signs on them, not of the railroads, but something like, 'The Lard That Put the Smell in Chicago,' 'The Ham with a Slam,' and all such things as that. The packers have cars made for themselves.

"Then all we have to do is to hook an engine to them and away their stuff goes.

You automobile men haven't any freight cars."

"I gotcha, Steve," replied the automobile dealer as he went away.

Patterson's wild-animal shows had put up for the winter down at Paola, Kansas, a few miles below Kansas City. Their cars—great long ones—were interned on a siding in a corn-field.

The animals—two and four legged—were eating their respective heads off and wouldn't be worth a jitney admission fee until the season opened again. The automobile dealer went down to Paola and went into executive session with the circus-manager.

Hauled His Autos in Circus Cars.

He made a deal. The circus leased all its flat cars to the automobile man—thirty sixty-foot cars. They were painted a bright yellow, with lettering of black, advertising the dealer's certain make of motor-cars.

Then the Frisco hooked an engine to them and away they went to the motor-car factory. The dealer is now supplying his purchasers with cars and his competitors are searching the country for another circus in winter quarters that wants to lease its cars for the wintry season.

The circus-cars will be as good as ever for the next season, as a car on a siding deteriorates quicker than when in use.

When the sugar famine hit the West, in the season when Cuban and Louisiana sugar was exhausted and the Western beet sugar wasn't coming in yet, many grocers' supplies ran so low that they refused to sell more than a day's supply to any one. If a purchaser went to a strange grocer—one with whom he hadn't traded regularly—it was something like a stranger from Kalamazoo trying to get a personal check cashed at a bank in San Francisco or New York. He got the frigid grin—and no sugar.

It was along about then that a supervising engineer of the Rock Island went into a grocery store near his home and asked for some sugar. His wife had served his coffee "straight," and he didn't like it.

"Dollar's worth of sugar," he said to the grocer as he jingled the silver dollar in his hand.

"Nix on the camfloosage," laughed the grocer. "If I had a dollar's worth of sugar I'd retire and live on the proceeds of the interest from my Liberty bonds!"

"If you can't supply me I'll have to give my trade to some other grocer," the engineer threatened.

"I'll give you one-fifty for every dollar's worth of sugar you get from some other grocer," the man with an apron asserted as he laughed fiendishly.

"There's none in town then?"

"Very little. I've got six sacks up at the wholesaler's in Hutchinson, but I can't get them here until Saturday, when the pedler-car comes out."

"May I have a dollar's worth if I get those sacks here to-night?" asked the engineer.

"Sure," the grocer agreed

Late that night a perfectly reliable grocer and an engineer, whose name was as good as his bond anywhere he was known, crept into the shadows of the hut where the section foreman stowed his gasoline car when the crew put up for the night and cautiously unlocked the door.

Three minutes later they were speeding in the direction of the wholesaler's place of business. In the early hours of the morning they returned, bringing the five or six sacks of sugar.

The engineer got his dollar's worth, the grocer paid for the gasoline, and the section foreman, when he came down to work that morning, wondered why the engine of his car was not cool after a night's rest. But the government had all the idle cars in use and the engineer had to have sugar for his coffee.

Back to the Old Dirt Road.

The car-shortage, due to abnormal conditions, will have good results in an entirely different direction from railroad transportation. In the West and Middle West the earliest means of transportation—that of dirt roads—has been neglected

If the roads are good enough for summer travel the inhabitants care little what they are in the winter. A man with a flivver

can't enjoy it in December or January or February anyhow.

Now, when John Jones has forty hogs that are marketable and his wife needs the money for a new dress and John can't get a car, he naturally thinks of doing the next best thing—shooing the porkers aboard his auto and delivering them personally.

But there are forty impassable places between him and the marketing town. The hogs continue to eat his corn and his wife uses her last year's dress.

So the car shortage is the indirect means or teaching John and other Johns like him the value of good roads. The railroads of the Middle West have been teaching and preaching good farm-roads for years.

Those unacquainted with the transportation problem will figure that, since the railroads secure their income from hauling freight and passengers, they will be practically without an income when conditions again become normal, because people will have learned to solve their freighting problems, when the truth of the matter is the people have merely solved the problem of the "short haul."

At the beginning of the acute car-shortage an automobile distributer, becoming angry because the railroad couldn't furnish cars to transport motor-cars from the factory, sent men to Detroit and started back West with forty cars.

Although it was during the summer season the trip from Detroit to Kansas City occupied fifteen days. When the cars reached Kansas City they were marketable only as used cars.

The cost was something like ten times what railroad transportation would have been. When things reach normal again this dealer will have ceased to object to every advance in freight-rates. There will be good farm-roads reaching the central shipping points and the railroads will get the long-haul traffic.

The "pedler trains," slow-moving, expensive, retarding other traffic, will have ceased to exist. And the John Joneses will have come to a correct realization of what transportation means to them. They will see then that lack of transportation as furnished by the railroads would set this country back to the days of the cowboy and Western gunman.

War may not be all that General Sherman said it was after all. It may knit together a new America.

THE FAST FREIGHT.

BY T. J. MURRAY.

IT swirls from terminals at market's close,
Fleeing from inland shed or seaboard pier;
Swaying where interlocking switches sheer
Its flying passage out where night wind blows.

It spurns the miles that bar the distant goal,
While in the evening mist its tail lamps swim;
Sweeping o'er bridges where the waters brim,
And roars through hamlets like a battle roll.

It rocks past sidings where arrested trains
Wait on its pleasure; then, with whistle screams,
It grinds the crossing where the red lamp gleams,
And wins to terminus as daybreak gains.

FIGHTING HIS WAY DOWN.

BY WILLIAM H. HAMBY.

Neither Dirty Work Nor Dirty Weather Could Balk Jim Darrow with Isonia Working for Him.

CHAPTER I.

OLD FRIENDS AND NEW.

JIM DARROW walked quickly from the train to the end of the station-platform. He dropped his grip and stood breathing deep and taking in the sweep of the mountains.

He had never seen any real mountains before—mountains that rose up and up through the radiant June sun, until the white sword of the crest cut the blue sky three miles above the sea.

Darrow emitted a long, pleased whistle, and, turning to the only man in speaking distance, a fellow in overalls who stood watching him, declared:

"I like Salida."

The fellow shook a long, bony face gloomily.

"It ain't no place for a working man."

Darrow laughed. He felt good this morning, better than he ever had in his life—for he was on his way to do something big, wonderful.

"My friend, confidentially now just between us two, is there any place in the world good for a working man—who doesn't want to work?"

The gloomy fellow's face did not change expression; but his eyes moved slowly and disapprovingly along the range of mountains to the north, and rested sadly on the open valley of green alfalfa and leafy cottonwoods to the west of town.

"I ain't never kicked on work," he said slowly. "And I ain't purticular what I get for it. But I am durned purticular who I work for, and what sort of a son-of-a-gun he hires for cook. If I got to live on garbage I ruther set on the barrel and eat it, than to swing a pick for it."

"Boss not been feeding you right?" smiled Darrow.

"Right!" said the fellow in deep disgust. "There ain't any such animal in these hills. The best you can ever hope for is 'It 'll do'"

"My name is Darrow, Jim Darrow."

He held out his hand, still smiling.

"I think I'll need some help, and I'll promise you the cooking will be just as good—as you are used to."

"My name is Bill," said the fellow with an air of gloomy unconcern.

"Lugubrious Bill," laughed Darrow; "L. Bill for short. Well, come to the Sherman Hotel at six o'clock to-night, and let us talk about jobs and grub."

Darrow went up the street to find his friend Earl Sumner. He had rather expected Earl to be at the station. He had written him he was coming West, and mentioned the train on which he would arrive.

They had not met for some years—since he had lent Sumner his shirt to get married in. Back home it was understood Earl had made a pile of money since coming West. Jim had some surprises of his own to spring on his friend.

The stenographer in the outer office of "Sumner, Welch & Wallace, Mining Exchange," told Darrow that Mr. Sumner was busy at the moment in the private office It was a frame building, and the offices not imposing, but Jim knew big transactions may be made in very small quarters.

There was one other waiting—a girl with

a package of papers in her hand. She wore a light summer coat that was both business-like and becoming; and her eyes were a steady gray, with a fleck of brown in them, and there were tiny lines at the corners of her mouth, as though she had held it sober much of the time when it wanted to laugh. She was the sort of person, thought Jim, who would understand people without criticizing them much.

Directly Sumner came in, rather aggressively for a scrawny man, barely nodded to Jim, evidently not recognizing him, and turned to the waiting young woman.

"Well?" There was an edge to his tone. "Are they all right?"

"They are in legal form, if that is what you mean, Mr. Sumner," she replied.

"That is what I mean, of course."

He added the "of course" to try to cover up the exasperation in his tone.

He had unfolded one of the papers and was rapidly running over it.

"What the devil did you change them for?" He turned on the young woman angrily.

"Because"—her tone was even, but the brown flecks seemed to spread and darken in her eyes—"it was not legal the way you had written it."

Sumner started to swear, but seemed to remember there was a man present.

"Oh, well," he gave his hand a dismissing fling, "make out your bill—there won't be any more."

The color changed in the girl's face, and Darrow saw as she left the office that she was biting her lower lip until it was bloodless.

"Hello, Earl." Jim rose up and held out his hand with a smile.

Sumner looked him over with one furtive sweep of his eyes; and seeing he wore good clothes, shook the hand with moderate enthusiasm.

"How goes everything?" asked Jim, as he took a chair facing his former friend in the private office.

"First rate," said Sumner briskly.

He had changed a good deal. He had lost part of the curly hair on top of his head, but to make up for it wore a narrow, pointed beard. He had a knobby head, black eyebrows, and the small, narrow face gave the impression that all of it below the nose was screwed up into a small pucker around his mouth.

"How are you, Jim?"

Perhaps he had remembered the borrowed shirt, anyway there was an attempt at cordiality.

"Still doing the cricket act—singing in the sunshine all summer long—and warming by your friends' fires in the winter?"

"No."

Jim's face grew serious, intent. His smooth brows wrinkled, his lips shut firm.

"No, Earl, I've fooled my family and friends—I've put something over. You know they all have most ardently wanted me to succeed; but none of them ever expected me to do anything. So I fooled them a trip, and went to a mining-school—and graduated!

"I've been working two years now, in Joplin and the Southwest." He said it with distinct pride. "And I earned my money, Earl—and—don't drop dead now—I saved it. My uncle left me a little more; and so I am out here, to do what I've dreamed of doing since I was knee-high—be a real miner."

Earl reached over and grabbed Jim's hand—the same warm friend he was back in the days of the borrowed shirt.

"You are headed right, old boy, dead right. And I know the game from bottom to top. It is lucky you got in to-day. D. T. Mullins, of Denver, one of the biggest mining men of the West, is to be here this afternoon. I want you to meet him. Come back at four, can you?"

As he turned the corner toward his hotel, he saw Lugubrious Bill across the street, standing by a hot tamale-stand, talking to a big, bony fellow with an ugly face, and ears very large and high on his head—his hat pressed down on them made them look like bat's wings. As they saw Jim, he turned, asked something, and L. Bill nodded.

When Jim entered the hotel office, the girl he had seen at the mining exchange was talking to the clerk.

She did not see him as he approached the desk until he reached for the register.

Her face filled with confusion for a moment. Then she coughed, and remarked frankly:

"I was just inquiring about you—I wondered who you were."

CHAPTER II.

MYSTERY, BUSINESS, AND MYSTERY.

THE young man held out his hand.

"I am Jim Darrow, from back East—that is, east of Kansas."

"I am glad to know you, Mr. Darrow." She took his hand. "I want to leave you my card."

She took a little square of cardboard from her hand-bag. It bore the name:

ISONIA L. WITMER.

In the lower left-hand corner was penciled

"Mining Adviser."

"Not a clairvoyant, are you?" he bantered.

There was a girlish gurgle to her laugh, and the pink showed in her cheeks.

"N-o, and yet I can foretell some things."

"What, for instance?"

She puckered her forehead and playfully assumed the blank stare of a seer as she intoned:

"The bite of a dog—the coming of snow—the death of a lark."

The bellboy had picked up Darrow's grip and stood dangling the key in his hand, waiting to show him to his room.

"I'll keep you in mind, Miss Witmer"—he rose politely—"if I need mining advice."

"Then you will keep me in mind," she replied meaningly.

She walked half-way across the lobby with him, and, standing close to his shoulder, said hurriedly:

"Don't buy anything of Sumner—don't buy any mine now."

She turned quickly to the door and went out on the street. He stood watching her in surprise until the bellboy was to the top of the stairs, waiting and dangling his key.

"What a revengeful little baggage!" he laughed to himself as he went up the stairs. "Earl called her down about something, and she is getting even by trying to spoil a trade. She does not know, of course, Sumner is an old friend."

Darrow was impatient for four o'clock to come. He wanted to meet the big mining man from Denver and talk over with him and Earl the plans for getting hold of the sort of mine he wanted.

Jim got up and started to unpack his grip. No, it would not be worth while. He would be here no more than a day at the most. He would be up and away among the mountains to-morrow—in quest of his life dream—the most beautiful of all ores—silver!

Earl had referred to his cricket days—the years when he was light-hearted and irresponsible, and did a little of everything and not much of anything; the days when everybody loved him and nobody believed in him. They thought that was all he wanted to do—that that was the real Jim Darrow.

"Bah!"

With tremendous violence he flung his open suit-case across the room.

"That silly, singing fool, that merry-maker, the real Jim Darrow!"

Always there had smoldered the coals of discontent; always he had hated to be a dabbler in little things, and a failure. One day, one glorious day, his chance would come, and then he would show them, and the world and all his tolerant relations would know he was a man of action—and of force!

This ambition had hung always around the neck of his fair dream of silver; he would be a great silver-miner, a man of vision and wealth and power.

For four years he worked his way through the mining college; and for two years more he had worked as a mining engineer in the zinc and lead mines. He

had saved every dollar of his wages above the barest necessities, and then came his little bequest from his uncle.

And now he was ready for the great opportunity!

He stooped grinningly and began to gather up the soiled collars, the sprawled shirt, and scattered toilet articles his flung suit-case had sowed across the room.

"I am glad to meet any friend of Sumner's."

Mullins nodded toward Earl in a complimentary way. The three were seated in the private office of the mining exchange.

"And if my advice is of any use to you, it is as free as water in a dry State."

He laughed at himself and struck his knee with a broad, open palm.

He was a big man, and very dark—looked as though there might be a drop of Mexican blood in him. He had very black, coarse hair, clipped short, and his skin was thick, with here and there dark-red splotches. His cigar always slanted up a little, and his eyes down, except when he was driving home a point, and then both cigar and his eyes pointed straight at his listener.

Jim was not usually bashful, but he could not help but feel a little backward in the presence of this great mining king, whom Earl had told him was worth twoscore million at least. He must be a very busy man; and it seemed presumptuous to take his time asking advice over little affairs.

"I want to get into the silver-mining game," said Darrow modestly. "I know mining theoretically—had it in college—at Rolla."

"Good school."

Mullins's cigar had gone up, his eyes were lazily down, looking somewhere about the toe of Jim's shoe.

"I have a little money—just a little," ventured Jim.

"How much?"

The cigar described a short arc, as though being vigorously chewed.

"About seven thousand dollars."

"Enough to start on," Mullins said reflectively.

Sumner was leaving all the conversation to his visitor.

"Yes."

Jim was delighted with the great miner's approval.

"I thought with that I could lease a good claim and make slow, careful development until I struck something that would give me more funds."

"Now see here!"

Mullins's tipped chair came forward and struck the floor with a whack. His black eyes came up and looked fixedly into Jim's; and the cigar, no longer smoked, pointed like an emphatic black finger.

"Don't waste your life doing anything like that. Why, young man, you find mummies, walking skeletons, all through the mountains; old men who started out as young and full of hope as you are, and have prospected all their lives. They die up there beside their camp-skillet and their ragged hole in the ground—not a dollar, not a friend; ten to one, not a scrap of food left in their camp when they are found."

He paused for a moment and then said shudderingly:

"It is awful to starve!"

Jim was distressed, depressed, confused.

"Well! What—how would a man start?"

Mullins had tipped back again. His cigar was angling upward, his eyes down. He was smoking slowly.

"With friends," he said, after a moment of thought.

"I tell you"—he threw out his hand with sudden generous impulse and turned to Sumner, who had sat pinching his narrow, bearded chin during the talk—"I'm going to put him in charge of the Ben Bolt mine!"

"Why—er—why—that would be fine," said Sumner in great surprise.

"The Ben Bolt," he turned back to Darrow, "is one of my new mines—a small one, but has a very promising vein of silver and lead. You with your scientific knowledge of mining are just the fellow for superintendent. I've been offered fifteen thousand dollars for it. But I expect great things of you; I'll sell you fifty-one per cent of it for six thousand dollars. That will leave you one thousand dollars to go on.

"You can take full charge—develop it in your own way. Show the sort of stuff you

are made of, and if you make a success of it as you will—there will be bigger things waiting for you.

"You can pay all expenses from the output. Allow yourself a salary of two hundred a month; and then whatever the mine yields over that will go to the stockholders as dividends."

"Is that all right, Sumner? Sumner," he explained to Jim, "owns a little stock in that mine."

"It is all right with me," answered Earl "It is selling it mighty cheap; but I've known Jim a long time, and believe he'll get out all there is in it."

At six o'clock next morning the new owner of fifty-one per cent of the Ben Bolt mine got to the station with his camping-outfit rolled up in a big tarpaulin. L. Bill was already there, gloomily awaiting him

"How are you, Lugubrious?" Jim said gaily. "All ready for the great adventure?"

L. Bill looked slowly off to where the early sun glinted the snowy top of Shawano.

"What I want to know," he said, is who's going to cook?"

"Why, you are," said Jim.

"Me?"

For once L. Bill spoke promptly.

"Me? I ruther board with a family of rattlesnakes than to eat my cookin'."

"Don't worry."

Jim laughed and began to gather up his load. The little narrow-gaged train had pulled up to the depot.

As he started for the coach, a girl went up the steps ahead of him; and, although covered with a dark traveling coat, he knew her.

"Bill," he turned to his gloomy companion, "who is Isonia Witmer?"

CHAPTER III.

JIM DISCOVERS A VAMPIRE.

"A GIRL," answered L. Bill.

"How observing!" laughed Jim. "I thought perhaps she was an aeroplane."

The bell was ringing, and they climbed on with their loads. After the bundles of the camp-outfit had been deposited under the water-cooler in the smoking-car, Lugubrious Bill added:

"And girls are dangerous. I don't know of nothin' more dangerous, 'less it's a Mexican cook that puts poison in the grub."

Jim laughed again, but Bill's expression never varied so much as a wrinkle

"You seem to have had experience."

"I reckon I have," said Bill gloomily. "I married one once; thought she was a good cook—and I give her seven hundred and ninety dollars to fit up a shack. She never come back."

"What ever became of her?" Jim asked with serious face.

"Last I hear of her"—Bill looked stolidly at the back of the seat in front—"she was back in Kansas livin' with her first husband. Had bought a barber-shop for him with my money."

Jim felt it would be crass to laugh at another man's tragedy, so to save himself he went back into the other car—to brave the danger of meeting Isonia Witmer.

"Good morning, tenderfoot."

She smiled up at him mischievously as he stopped by her seat.

"Sit down."

She made a place.

He did not resent her calling him a tenderfoot; but there was something in her tone and look that made him feel as though she was sorry for him; and he did not like that. No one in America needed pity so little as did Jim Darrow that morning he started on his big enterprise. He said nothing to her of his deal. He did not want her to know he had disregarded her advice. Neither could he embarrass her by telling her Earl Sumner was an old boyhood friend.

He spoke of the blue, swirling little mountain river outside, with its strip of cottonwood and willows, and the green fields and orchards, and the mountains that huddled them

When he looked around there was something in her face that puzzled him—some intent yearning—a sort of wistful eagerness—and he almost believed there were two tiny tear-marks on her cheeks.

"If one could only keep that," she said pensively.

"What?" he asked. She smiled again.

"Oh, you don't know yourself at all, do you? No more of your strength than of your weakness."

He puzzled over that a moment. He did not admit he had any weakness. He did not know what she meant by his strength.

"I was thinking," she said seriously, "of how beautiful it is to love the stream out there, and the mountains, and the sun."

There was a look of seriousness and disillusionment in her face

"If things—and people—didn't come along to spoil our beautiful zest for the morning."

She told him she was on her way to visit an uncle at Sargent, just over the Pass.

Jim felt a glow at that news. He would be working only ten miles from Sargent.

"Who keeps your office while you are away?"

"I have no office."

"I thought"—he hesitated—"why, I thought you were a mining adviser."

"Y-es."

She looked out of the window.

"I am—but my advice is not very effective."

He felt uneasy. Did she know he had ignored her warning? Really, who was she—why had she warned him? Could it possibly be that she did it for him, and not for revenge?

"The advice I give"—she was speaking as though to the wall of the mountain which they were skirting—"is from experience."

And then, tapping the window-ledge with white, flexible, strong fingers, she intoned.

"A fool there was—as you and I."

The little train had gone over Marshall Pass, and squeaked on clamped brakes down the steep grade to Sargent. She rose and held out her hand.

"Good-by—when you discover you have been—"

She broke off suddenly. There was real pain in her face—she gave his hand a sympathetic clasp.

"Oh, well—don't hate the mountains—and time. Good-by."

She went out quickly, and was met at the steps by her uncle, a sandy-bearded country storekeeper.

"Odd sort of a girl," Jim said as he went into the smoking car to get L. Bill and the baggage ready for the next stop. "I never saw anybody like her. I wonder what she meant."

"Bill," asked Darrow, as they loaded their stuff into an old wagon that was part of the equipment of the Ben Bolt, "who was that ape man or man ape with bat ears you were talking to by the hot tamale-stand yesterday afternoon?"

"I wasn't talkin' to him," said Bill. "He was talkin' to me."

"Well, who was he?"

"Bunk Corbin. He's about the best hand with a pick in the State. Said he was goin' to hit you for a job."

"Well, we'll need several men," said Jim. "He looks ugly enough to be a good hand."

One September evening, while the sunlight still glinted on the crown of Ouray, two men slowly picked their way along an indistinct trail across the side of the mountain. The one in front carried a roll of bedding and tools, and staggered and stumbled as though about exhausted. The one behind carried a heterogeneous string of cooking things—pots and pans and skillets and buckets—fastened together by a rope, clanking down his back.

Over the rocks and through a clump of pines they came out to a level shoulder of the mountain, overlooking the railroad. The little station of Sargent was two miles below.

"We'll camp here."

Jim Darrow threw down the bundle listlessly. He went off a little to one side and sat on a fallen pine-log, while L. Bill got a fire started, found water, and put on the coffee-pot

Down the mountainside and along the little gash far below the aspen glowed with dancing yellow. The pines filled the air with the pungent tang, and the coming twilight was still and soft and brooding.

But Jim did not see the yellow aspen, nor the glint of vanishing sun on the top of Ouray. He saw nothing but murky gloom in the gulch below.

The four other miners had been dis-

charged, the camp broken up, and he and Bill had started back—to where? He had only four hundred dollars left

They ate the bacon and onions and rye bread that Bill set out, and drank the strong coffee in silence.

"Bill," Jim said bitterly at last, "I believe Mullins and Sumner knew all the time that mine was worthless."

"Sure," nodded Lugubrious Bill between gulps. "I've worked for four different fellows they have sold that same mine to."

"You have?" Jim's anger flamed him into energy again.

"Yes."

"And they fixed it all up to trim me—whole thing was a plain steal!"

"Sure."

Bill blew on a tin of coffee to cool it.

"Why in the devil didn't you tell me?" he thundered angrily.

"Never asked me," said Bill unconcernedly. "Givin' information you ain't asked for," pursued Bill sagely, "never gets you any grub!" Twenty minutes later L. Bill was snoring under his blanket.

Darrow went down the dim trail, out of hearing, and sat on a rock at the very edge of a high precipice.

Night had come swiftly. The stars glittered in the thin, clear air. The occasional gusts of wind set the pines moaning on the mountainside above.

"A fool there was," said Jim bitterly—"and the vampire was a man—and a friend."

He felt a murderous rage toward Sumner and Mullins. But Sumner most; Sumner had betrayed his friendship, used it to allay his caution.

He ought to have investigated. It was a fool thing to do—to buy a mine he never saw, merely on another man's word. There are hundreds and thousands of others who do it, he justified, but they, too, got, what he had—a hole in the ground, empty pockets, and a heart full of bitterness.

Well, he was done for—his money all gone, just enough to give him some decent clothes and a ticket back home. He had a living there. He was a good fellow; they would be glad to see him back—the summer cricket!

"Bah!"

He kicked a loose boulder crashing down the precipice. He got up and shook his fist at the stars.

No, by Heaven! He'd starve on these rocks before he'd ever go back to the old, dabbling life, the life of nothingness—of liking, but of pity. He would be a new man—even if he was a failure. First he would go down and kick Sumner around two blocks, and then he would get a job.

He heard the rolling of a rock below, the crunch of pebbles. Sounds carried a long way. Some one was coming up the trail—some one attracted by the light of his campfire.

Directly the figure emerged from the shadows below into the starlight—paused a moment and looked around.

It was a woman.

CHAPTER IV.

HELP FROM ISONIA.

DARROW recognized the figure. It was Isonia Witmer, and she came on up the trail and sat down on the rock beside him, as though it were the most natural thing in the world for a girl to walk in out of the night to a camp in the mountains.

"And are you through with the mine?"

There was subtle sympathy in her tone and manner.

"Yes, all but kicking that contemptible rascal out of Salida. I did not take your warning," he said bitterly, "because he was a friend of mine, and I thought he would be square. And then, too, I heard him speak sharply to you in the office—and thought you were out for revenge."

She sighed.

"There are so many possible motives for every act, we nearly always pick the wrong one, don't we? I cared little for what he said; but I hated to see you cheated; you looked so—so hopeful and buoyant—it seemed a pity—"

She broke off and sat looking at the stars over the mountains beyond the gulch.

"My work for him was not important," she resumed. "I have worked in an abstract office, and know something of mining

papers—and occasionally am consulted as to legal forms. That was all the work I have done for Sumner. It did not matter to lose it, but I wanted to warn you—because I, too, had bought a mine once—with all the money I had."

"And you lost?"

She laughed ruefully.

"I should think you would not need to ask."

"Men like Sumner and Mullins—I don't believe, now, Mullins is any great millionaire silver man—"

She turned to him in surprise

"Did you think that?"

"Yes," he said sheepishly. "Sumner told me, and I believed everything he said."

"Why," she explained, "Mullins is a partner, secret partner, of Sumner's. They make a living selling worthless mines. Neither of them has much money. Perhaps they have stolen a million, but they are also losing. They have a good deal of mining property of one sort or another, but none of it is paying, except when they sell it."

The more Darrow thought of the way he had been cheated, the angrier he grew. Well, there would be one effective settlement at last. They would get a price for the Ben Bolt that had not been in the contract.

"What are you going to do?"

The simple, practical tone of the girl brought him back.

"Get a job. A mining engineer ought to find a job—although a mining engineer that has been as big a fool as I have doesn't deserve one. There are traces of silver, however, in the Ben Bolt mine; just enough to keep up hope; but not enough to make any money."

"Oh, yes," she said; "there is silver and lead and copper all through these mountains. You can hardly open a claim that does not show some of these minerals. But it is like fattening a herd of cattle on twenty blades of grass. It takes more than a trace to be profitable. How much can you get a month?"

"A hundred dollars, perhaps, at first."

"You are worth more than that."

He turned on the rock until he faced her squarely in the starlight.

"You are the very first person that ever told me I was worth more than anything. I am not, but I thank you."

"Oh, yes, indeed you are," she said earnestly. "And I do not believe if I were you I would work for it—I would go on mining."

"Go on mining! Why, girl, I haven't but four hundred dollars left."

"You can do a good deal with four hundred dollars—and brains," she said

"But where would I prospect—and don't prospectors all die failures?"

Again she laughed.

"No, not those who prospect with intelligence. A man who starts out without knowledge or plan may dig a thousand holes in these old mountains, and die at last with an empty tin beside him.

"But you are a mining engineer; you have brains and technical training. If you would go at mining as an expert really should, you would stand at least one chance in three to do something big."

"You believe in a chance for something big rather than a small, sure thing?"

"In your case, yes. You will always have a small, sure thing to fall back on—and you have no one dependent on you.

"You have learned mines in books, and you have learned something of men. Now start out and learn something of the mountains. When you find what seems to be a promising claim, lease it, and work it a while

"I have thought a good deal on this."

She arose. "And if I were a man, that is what I would do."

"Did you come up here to tell me this?"

He also arose.

"Yes"

"After I had ignored your advice before!"

"A good adviser," she laughed, "must be like a good forgiver, and not quit under seventy-seven times."

"How did you know I was up here?" He had been wondering about that.

"I heard your camp was broken up and you had started in. I saw the camp-fire."

"I'll go down with you," he offered, as she started down the starlit trail.

"No," she said positively. "You are

tired—the climb back would be hard. I'm not afraid."

"Miss Witmer"—his tone made her pause—"I can't tell you what your coming has meant, but—I'm going prospecting tomorrow."

About eight o'clock one evening three months later there was a knock at Isonia Witmer's door. A miner in rough work-clothes stood before her.

"Why, if it isn't Mr. Darrow!"

She took his hand and drew him, grinning, into the light.

"I've come straight for advice this time," he said as he took a chair and flung his bespattered felt hat on the floor. "I think I've found a good prospect."

"Tell me all about it."

Her face was aglow. He had changed in these three months. He was not lightly egotistical now, but self-reliant, and yet ready to listen to her advice.

He told her of his three months' adventures in the mountains—three months of wandering with L. Bill, in which he had studied other mines, talked with miners, observed outcroppings, tested leads here and there.

His story was full of interest; humor crept out more often than metal had, and he had unconsciously that love for the mountains she had first seen in him

"And where is this fine prospect?" she asked.

He looked her levelly in the eye. He could trust her. He knew he could.

"It is about three miles south of Shawano," he said, and detailed the location and what he thought were favorable signs.

"Whom does the land belong to?" he inquired.

"We'll see."

She arose and brought to the center-table a map of the district; took a pencil, and leaned over it, tracing the lines.

Her face in the light, the soft sheen of her hair, the little intent pucker on her forehead as she studied the map, looked very girlish and appealing. He had never seen any girl who had so much sense and was so unobtrusively attractive.

"Who owns it?" he asked, as she straightened up and looked toward him with a dismayed sort of gesture.

"Mullins."

CHAPTER V.

A FIGHT AGAINST TIME.

"THAT settles it," said Darrow. "I don't have anything to do with Mullins."

"Of course you will," said Isonia Witmer. "Nothing is more foolish than to run away from a man who has bitten you once—except to stand up and hit him with your fist. Hit him with your brain. This is not his deal. This is yours. If you think that is a good claim, lease it for a year and take a bond—so you can buy it at a certain price in case you make a strike. In your lease and bond get the best figures possible, and then make him sorry by making a fortune—for yourself."

Darrow grinned, ashamed of his pettishness.

"Lugubrious Bill once told me there was no such thing as 'right' in these mountains. But there is a girl by that name. You are always right—and you have the job fixing up the papers, and putting the lease through with his Purple Hogness."

"Are you going to keep on here all the winter?"

L. Bill was not given to asking questions. But Darrow had just told him that he had the lease extended three months. They had been at work on the claim a year; and Bill had thought Darrow was going to abandon it.

"Perhaps," Jim replied, refilling his pipe. It was the last of September and still warm up in the mountains. In the year of hard work and always deferred hopes, Darrow had become more silent; not moody, but retrospective.

"We've got grub enough to last another month, haven't we? he grinned at L. Bill. "I'm going to bring up two more men and a hauler next week," added Jim. "I've hired that bat-eared man again. I think we can get out a car of pretty good ore by the end of three months."

They had found some silver from the start, but the ore was not high-grade. They had got out one car of twenty-five tons in May which brought something over seven hundred dollars, and another in August which ran a little better.

This had kept Darrow going. He had worked four men part of the time, but of late only he and L. Bill had been working. The ore they were getting would never pay for extensive mining; it scarcely made wages the way they had to handle it.

"Bill"—Jim reached for a stick with a coal on it to light his pipe—"what do you think? Or do you ever think?"

"I've quit thinking," replied Bill. "I just work and eat—when I can get anything fit to eat."

"Well, if you were going to take a lay-off from eating, Bill, and do a little thinking, what would you think about this mine? Will we ever strike anything worth working for?"

"Do you know what I'd do," said Bill solemnly, "if I owned all the mining claims in the world?"

"No; what?"

"I'd swap 'em even for Sig Lowden's restaurant at Salida."

Jim laughed.

"It might not be a bad trade, Bill!"

And he sat by the dying supper-fire and thought it over after Bill had gone to bed. At the end of the year he had two hundred and seventy-five dollars less than at the beginning. A whole year of hard work, and only a hundred and twenty-five dollars left. Really, wasn't he a fool to hang on?

Yet there was promise in the mine. It would look good a few days and then run thin again. But always he hoped and worked on.

"Well"—he got up and flexed his muscles, now tough as a boxer's—"I'll go on as long as that hundred and twenty-five lasts."

The 15th of December Darrow took L. Bill to one side.

"Bill, I'm going to beat it across the mountains to Marshall Pass and go down to Salida. I'm going to leave my gun with you. Don't let a fellow leave this camp until I get back; understand? And if a stranger drops in, don't let him leave—even if you have to tie him down.

"Now, Bill, I'm going to trust you: no man must leave this camp until I get back."

Bill took the gun without comment; but Jim knew he would obey orders—at least it was safer to leave things in his hands than with any other. He mistrusted Bunk Corbin, the bat-eared man, more than the rest.

There was six inches of snow, and it was drifted in places; the wind was blowing about thirty miles an hour. It was seven miles to Marshall Pass, with no certain trail, and a rise of four thousand feet.

But Jim had grown used to hard climbs—and to-day there was a fire in his blood. He faced the cutting wind with joy, and plunged through the drifted snow like a hilarious boy. He had made the big find—he had struck ore worth mining—ore that would run two hundred dollars to the ton; and it looked as though there were hundreds of thousands of tons of it—and it grew richer the farther they went.

But his lease had only two weeks to run. He must get down to Salida and renew the lease and bond before Mullins and Sumner heard.

No one who has never breasted a northwest wind, over an unbroken mountain trail that climbs to eleven thousand feet, can guess the fight Jim Darrow made to reach Marshall Pass in time to catch the seven o'clock train.

He got there as the train did. He was limp and sore and out of wind as he stumbled into the end of the snow-shed and the smoky darkness. He gathered a last burst of speed and ran staggering down the track to where the car-inspector was still poking under the coaches to be sure the brakes, the air, the couplings, everything, was right, before the little narrow-gaged train started down the terrific grade with its freight of human lives.

Jim climbed in and dropped into the first seat just as the train started.

"No," said Mullins when Jim asked him next morning in an offhand way to extend the lease. "No, Darrow; you don't seem to be doing any good up there, and I guess you better try somewhere else."

The young man felt the sickness of fear creeping over him, but he kept an open countenance.

"I'd really like to hang on there this winter. Got my camp fixed up. We are getting out a little stuff—nearly enough to pay expenses."

Mullins's black cigar went around and around in a short circle as he chewed the end of it. His eyes were on Jim's feet. He shook his big head decisively, and his thick lips opened slightly.

"I'm right busy to-day, Darrow. Of course, I'll do anything I can to accommodate you. But there is no hurry. Come back when the lease expires and we'll fix it up."

Jim went out very uneasy. To rush things now would be a giveaway. To wait two weeks—Mullins would be sure to learn of his strike.

He considered if it would be possible to raise the money to take up the bond. Under it he had an option on the mine at eighteen thousand dollars.

Darrow went to one of the banks, the one where he kept his small account. He got an interview with the cashier, whom he believed he could trust.

"My dear sir," said the elderly cashier when he heard Jim's story, "a banker in Colorado who could lend money on a mine would not be allowed to go to the penitentiary; he would be sent straight to the insane asylum.

"You see, never a day passes but some fellow comes in from the mountains with an excited story of what he has struck, or is about to strike. It is so common nobody pays any attention to it. If you'll start out now and go to every man in town who has money to invest, you will find not one of them will listen past your first sentence, 'I've struck it rich.'

"People here have lost so much in mines, been fooled so often—and seen tenderfoots fooled still oftener—until it is impossible to raise money on anything but the metal itself."

Jim knew he was right. He had not expected any encouragement from the banks. It would be impossible to borrow eighteen thousand dollars on any sort of mine in two weeks. Of course if he had time to take it up with real mining operators, and they could send their experts, he could eventually sell it, could get money on it. But not in two weeks.

There was just one hope, and that was, if he could keep the strike a secret for fourteen days. It would be hard, but it might be done.

He caught a freight and got over to Shawano at five o'clock. At six he walked into his camp.

There was a fire in the cabin used for cooking, and a lamp burning on the table.

Jim pushed open the door. Only two men sat at supper.

"Where's Bill?" he asked quickly.

"Leg broke," said one of the men through a mouthful of beans.

"And Corbin?"

"Gone. Him and Bill got in a fight, and he left about a half-hour after you did last night."

CHAPTER VI.

AGAINST ODDS.

DARROW went to L. Bill's cabin.

"What's wrong, Bill?"

Jim sat down on a box by the cot. A smoky oil-lamp burned on another box used for a table.

"Leg broke," replied Lugubrious. "I always get the worst of it—even in a fight."

"What was the fight about?"

Jim had already begun to understand a number of things that had happened the past year.

"There wasn't any fight," said Bill. "That ape came up behind me and broke my leg with one kick."

"Why did he do it?"

"'Cause I had the gun, and he wanted to get away."

"Bill," said Jim conclusively, "I believe Corbin broke your leg to get away and warn Mullins before I got there. I thought I saw something ahead of me twice. He must have climbed onto the back end of the car after I got in. I believe he is a spy working for Mullins and Sumner."

"Sure," said Bill in gloomy disgust.

"Did you know it all the time?" demanded Jim.

"Of course," replied Bill

"Well, why in the devil didn't you tell me?" Jim was madder than he had been for years.

"You didn't ask me," said Bill

"Oh —" Jim got up wrathfully. "Bill, you make me want to commit murder! I'm glad he broke your leg. If he hadn't, I would."

Darrow went out and down to his own cabin.

"That," he said, as he lighted some paper and stuffed it into the sheet-iron stove and began to throw in kindling, "was why Mullins put me off about the lease; thought he'd let me go on working up to the last day and then take over the mine

"Well" he sat down close to the little stove and put his hands on his knees—"a fool there was — and he has been a fool twice."

It was all up. He had made his big strike, and made it for the man he hated most.

In half an hour he got out some apples and a can of pears, and took them up to Bill's cabin. After all, Bill had stuck to him—and really, he had not asked his advice. It was Jim's fault—if there was any fault. Of course, Bill ought to have told him, but he had his own peculiar philosophy of life.

"Bill"—Jim spoke in a tone that signified amends—"did that doc from Sargent set your leg all right?"

"I guess not," said Bill. "They never do it right. Always leave a fellow crippled, or gangrene sets in, or something of that sort."

"You'll pull through."

Jim laughed in spite of his trouble.

"How much of that rich ore have we got out?"

"About four tons, I reckon."

That would be eight hundred dollars. It would help some. He would get out a few tons more before the lease expired—all he could. If only he had force enough—with that thought Jim was on his feet.

Why could it not be done? A hundred tons of that ore would do it — four carloads. Why, it could be done! If he could only get ten good miners—and wagons enough to haul it!

"Bill, where could a man get a dozen miners?"

"That doc said," replied Bill, "the Little Giant over north of Sargent has shut down."

"Bill"—and there was something in Jim's tone that made Lugubrious turn his head and stare at him—"I am going back to Shawano to-night. I'll go to Sargent on the morning train after those miners. We have to get out a hundred tons of that ore in ten days—and get it to the switch.

"You are still in charge here while I am gone. Keep Dave and Bob at work—and keep things under your hat. See if you can give the enemy as little information as you have me."

The second morning twelve experienced miners were at work. Darrow believed that Mullins felt so sure of getting the mine that he would merely wait for the seventeenth. He would not bother any further about what Darrow was doing. He had learned all he wanted to know—that a valuable strike had been made.

"Now, fellows," said Jim to his miners, "you are strangers to me, and I am to you. But every fellow that treats me square is going to be in good here. I've got to get one hundred tons of ore on the cars in ten days—and I want to do it so that no one knows it. We may have to work double time

"I am going to pay regular union wages for the first eight hours, and double wages for every hour you work over that. And if I get one hundred tons of ore to the smelter by the seventeenth, I'll give every man who stands by me fifty dollars besides his wages."

The men, who had recently been worried over being out of work, were glad enough of the job, and this extra offer made every one of them move with new vim

"Better begin to haul," suggested Lugubrious Bill, the third day. Even he had caught the spirit of the race.

"No," said Jim. "If we begin to load ore at the switch the news is sure to get

to Salida—and we will have to fight every sort of skullduggery from Mullins. I want to get the ore almost ready — then I'll put ten teams hauling day and night, and take the whole thing in one shipment.

"Where'll you get the ten wagons?" asked Bill.

"At Sargent, I suppose."

Jim had not yet arranged for that. He thought there would be plenty of time.

"Better get 'em," advised Bill.

Darrow took the hint and went to Sargent next day.

Only three teams and wagons could be got in the whole town. Why, even hauling every day now, three teams could not get the ore to the cars.

That would be a tragedy. To get the ore ready—to have the silver piled up—enough to buy the mine—his mine, his life ambition — and yet have the lease closed on him, and all because of lack of teams.

He might get them at Salida. But the teams and wagons would have to be loaded on cars and shipped the thirty-odd miles. That would not only take time, but would attract attention.

That ore had to be loaded some way at the switch! A new plan occurred to him. Instead of teamsters, he gathered five laborers, took them out with him, and put them to work on the three-mile road from the mine to Shawano over which they had hauled the small amount of ore that had been shipped before. By widening it a little — building up in a few places — it might do.

Jim caught the night train and ran down to Salida. On the freight, next day, he brought back a motor-truck that would haul four tons of ore over almost any road. He had hired it and a driver for twenty dollars a day.

It was going in deep. His money was gone—all but a few dollars reserved for car fare and absolutely necessary expenses. If he failed to get that ore in before the lease expired, he not only would lose his mine, but would be in debt nearly a thousand dollars.

He stopped off at Marshall Pass to see the station-agent about the cars. There is nothing at Marshall Pass but eleven thousand feet of altitude, sixteen hundred feet of snow-sheds, the telegraph operator, and the car-inspector.

The operator was a young fellow named Haley. He had a black mustache, a friendly eye, and a violin. His duties were mostly to be patient, and do his own cooking. Only two or three trains a day go over the Pass in winter.

Haley promised the cars. He called in Nixon, the car-inspector, a strong, hearty, whole-souled chap who was followed everywhere by a three-legged cat which he had rescued from under a car. Nixon swore violently at the cat—but Jim noticed it was fat.

"Sam," the operator asked the inspector, "have we four ore-cars on the switch in good order?"

"Yes," replied Nixon. "It happens that that blasted, blankety-blank engineer yesterday failed to take them down as he was ordered. We've got just exactly what he wants."

"I'll get orders," said the operator, "to have them taken down and switched for you at Shawano to-morrow."

It was the eleventh when the motor-truck began to haul ore and loaded it on to the car at the switch.

"We are going to make it, boys," Darrow said enthusiastically. "We have about eighty tons out now, and that blooming motor-truck, if nothing happens to it, can take the whole thing in by day after to-morrow."

There was one thing he must do yet—get down to the smelter and have an assay made of the samples, and arrange to sell the ore promptly.

The next day Darrow went to the office of the superintendent of the Salida smelter with his samples.

"I am taking out some good ore," said Jim confidently. "Have some samples here I want assayed."

"All right," nodded the superintendent.

"By the way," said Jim, "I'll have about four cars down here the fifteenth or sixteenth. How soon after I get the ore here can I get the money on it?"

"Well, we might get it through for you in three days."

"Three days!" Jim gasped. "Why—why, that would be the eighteenth!"

CHAPTER VII.

DARROW FIXES HIS FENCES.

"YES"—the superintendent of the smelter looked questioningly at Darrow "that would be the eighteenth."

"But I cannot wait that long."

For an instant he looked into the firm, efficient eyes of the superintendent. He was a man who made things go, a man with a grip that never relaxed. But he certainly was honest—and might be sympathetic.

"Look here"—Jim on an impulse took him into his confidence—"I have made a big strike up there; I know what I am talking about, for I am a mining engineer. I am opening up a body of ore that will be worth hundreds of thousands of dollars. But my lease and bond expire January 17.

"Under the bond I can buy the mine for eighteen thousand dollars. Now, if I do not raise eighteen thousand dollars by that date I lose. Mr. Malone"—he arose from his chair—"I've got to get eighteen thousand dollars before the bank closes January 17.

"Now can't you do this?" There was the persuasion of desperation in his voice. "Have those samples assayed; send back with me one of your best judges of ore, who will tell you the cars I am going to ship are as good or better than these samples; and then if I get in ore enough so that eighty per cent of its value, on the basis of these assays, comes to eighteen thousand dollars, can't you let me have the money in advance of the smelting?"

The superintendent, in his turn, studied Jim a moment.

"Yes, young man; I'll do it. I'll send an ore-buyer up about the fifteenth. If he says you have stuff worth, say, twenty-two thousand dollars, I'll let you have the eighteen thousand dollars as soon as your cars are on our tracks here."

"Mr. Malone"—Jim gripped the big superintendent's hand—"I—"

"Never mind," the superintendent smiled. "Get your ore down, and remember it must be delivered here at the smelter. This is unusual, but I believe in you and your mine; only, you understand, I must have the actual ore in my possession. We buy *only* at the smelter."

Darrow figured as he went away. The ore might not run as rich as he thought. It would not be safe to depend on a hundred tons. He knew the superintendent was not going to take any risk.

Malone was straining a point to buy in advance. He would not pay money on promises. The stuff had to be there at the smelter.

"Boys," he said when he got back to the mine, "we have to load five cars instead of four—and we must have them ready the fifteenth."

On the morning of the fourteenth they had four cars loaded, and seven or eight tons yet to be loaded.

"We must have the other car by tomorrow noon," urged Jim.

He took his place with the rest, and the whole force worked until four o'clock the next morning.

"I'm sure we have enough now," Darrow said. "Lay off, boys, and take a good sleep. I'm going to see this loaded, and stay with it until it is at the smelter."

The motor-truck had been running all night. Jim and the driver took a couple of hours' sleep, and then went in at six with another load.

By noon the five cars were loaded. The ore-buyer had looked them over.

"It is good stuff, Darrow, good stuff," he said with enthusiasm. "If it does not run three hundred ounces of silver to the ton it will fool me, and there is copper and lead enough to pay for the smelting."

Jim put two men on guard at the cars. He did not believe Mullins had heard anything of his plans; but if he had, he would possibly try to make trouble.

"Don't let anybody monkey around here," he instructed his miners. "I am going up to the Pass now, and get Haley to have these cars picked up by 328, if it does not come before I get there. It is usually several hours late. Anyway,

we'll get to the smelter by nine o'clock to-night."

Darrow climbed that four miles of steep, snowy track as though it were a spring path. Wouldn't the folks back home open their eyes in astonishment at the news·

JIM DARROW STRIKES IT RICH.

New Silver Mine Opened by Local Boy—Worth a Million

It might not be worth half that, but it might be worth much more. It meant a fortune, anyway—up into the hundreds of thousands. And by this time to-morrow he would have a deed to the claim in his pocket.

Wouldn't he celebrate! He hoped Isonia Witmer was in town. He owed it, really, all to her. She—well, bless her—she was a trump—and the sweetest girl in the world! He wondered if she might ever come to care for him. He had known—well, from the first—that there was no other girl but her. He had seen her but once in three months—since his big strike. He wanted to surprise her, not by promises, but by a real success.

"Hello, Haley!"

Jim shook the operator's hand like that of a long-lost uncle

"I've got my stuff already. Am I in time for 328?"

The operator bit the end of his black mustache and wrinkled his forehead.

"Sorry, Jim, but the old man has just canceled 328. It was four hours late out of Gunnison, and no special load. It was ordered back from Sargent not twenty minutes ago."

Darrow whistled disappointedly.

"Well, when will there be another?"

"Not until to-morrow morning," answered Haley.

"To-morrow is the sixteenth," said Jim. "Well, that will be time enough."

"In a hurry to get some stuff over, Jim?" asked Haley.

"Rather," replied Darrow. "You'll be sure they get orders to pick up my cars to-morrow?"

"You bet," said the operator accommodatingly. "I'll see that 328 gets them to-morrow, and they ought to get into Salida early in the afternoon if nothing goes wrong."

"That will be plenty of time," said Jim.

He went out and visited with Nixon, the car-inspector, who had just been going over a west-bound freight. Nixon explained·

"The old man—the master mechanic—said to me when he first put me up here: 'Sam, I never sleep for two weeks after I put a new inspector on at the Pass. For Heaven's sake, boy, don't let anything get by you. If a train breaks loose down that grade I'll lose my job, and it's a cinch you will yours.'"

"I guess none of them get by you," laughed Jim. "It seems to me you examine every nail in a box car."

"Well, you see," said Nixon. "on a grade that drops down nearly a mile in twenty, if the brakes didn't work, or a car got off center, or anything made a car jump the track—well, you know what it would mean to go over a two-thousand-foot bluff!"

"Well, Nix," said Jim, "don't find anything wrong with my cars of ore. I've got to get them down to-morrow."

"Those cars are all right," said Nixon. "I looked 'em over good before they went down."

"Say," the inspector asked as Jim started down the track, "is that fellow with the ears that flap like the sails of a catboat working for you now?"

"No."

Jim stopped and turned around with sudden apprehension. "Why?"

"Saw him get off 315 here this morning and start off across there in the direction of your camp."

CHAPTER VIII.

MORE SETBACKS.

"DIDN'T get the cars off?"

L. Bill manifested more surprise and concern than ever had ruffled his stolid face before.

"No."

Jim had returned to the camp for the night, and had dropped in to see how Bill was getting along.

"They are going to-morrow."

Bill shook his head dubiously.

"Suppose there is a blizzard to-morrow?"

The mere suggestion sent Darrow's blood down to the freezing point.

"I don't think there will be," he said hopefully.

"I think there will."

Bill was in a gloomy frame of mind now.

A fellow never gets what he wants. If it looks like he is goin' to—if it is just down the road, and all he has to do is go get it—it's sure to come to a blizzard and block the track."

"Don't be a croaker, Bill!"

Jim was irritated. The strain and loss of sleep had strung his nerves to the jumping point.

"We'll get that ore in all right."

But when he left Bill's cabin, he stood out on the shoulder of the mountain and studied the sky with deep anxiety. The stars glittered like the headlights of far-off, racing worlds. The night was so still the crinkle of the freezing snow could be heard a hundred yards.

There was no sign of a blizzard.

No. 316, the east-bound passenger, arrived at the Pass at 7.25—almost on time. The car inspector had examined the train from end to end, and given the conductor an "All right."

As the train puffed out from the long snow-sheds, leaving that dark tunnel of wood filled with smoke and steam, Nixon started for the side passage that led back to his stove and apples and unfinished supper. The smoke was so dense that the lantern made only a small hole in the gloom.

Suddenly from out the darkness a big man with cap pulled low leaped at him.

Nixon just had time to swing his lantern and send it crashing into the big brute's head. Then he was knocked down and kicked into insensibility.

When he came to he was almost frozen, but managed to attract the attention of the operator by his shouts.

Haley got him in on his own bed, and found that Nixon's arm and three ribs were broken and that he was badly bruised.

The operator went into the office, which adjoined his living-room, and called the agent at Salida.

"Get word at once to the master mechanic that Nixon has been hurt, and have him send up another car-inspector and a doctor."

A half an hour later the agent called him.

"The old man is going to send up an engine and caboose to-night, with a substitute inspector, and they'll bring Nixon back to the hospital. It was lucky. An inspector who used to work at the Tennessee Pass had applied for a job day before yesterday, and happened still to be in town."

Darrow was up early. In fact, he had not slept much. He went by Shawano to see that his cars of ore were still all right, and that the guards were doing their duty. Then he climbed on up to Marshall Pass.

"Had a little excitement up here last night," Haley, the operator, remarked when Jim came in.

"What was that?"

"Nixon and a hobo got into a scrap—not much of a scrap, either. The hobo, I suppose, had dropped off or been kicked off 316 last night, and for some reason took it out on Nix. Jumped on him in the dark. Nix got him one swat with the lantern and put it out; then the hobo smashed him up bad.

"When I found him, Nix had an arm broken in two places and three ribs kicked in.

"The old man sent up an extra engine and caboose from Salida last night with another inspector, and took Nix down to the hospital."

"What time do you suppose 328 will be along?" asked Jim.

"No telling."

Haley shook his head.

"They aren't out of Gunnison yet. With

a good bit of snow on the tracks beyond Sargent, they will be lucky to get here before three or four o'clock."

It was tedious waiting. Jim went out and climbed over the snow-sheds. He walked the length of the long horseshoe curve of protected track. Above the snow-sheds the snow was drifted twenty feet deep. He saw that without protection this strip of track would be buried in snow all the time.

He visited with Haley, the operator. He did everything to kill time. Every hour he would inquire about the progress of the freight that was to pick up his cars of ore.

Of course he had plenty of time. All day and all night, and until four o'clock the next day. It was only a matter of twenty-five miles down to Salida. Still, as ten o'clock, eleven, twelve, two came, and the freight was still hung up here and there west, he grew intensely uneasy.

The new inspector came into the operator's office and was introduced to Jim. His name was Burlett, and he was the sort of fellow who might lose his job over a game of poker

"Well, they are out of Sargent," said Haley at 2.10. "They ought to be here in a couple of hours."

"You are sure they have orders to get my cars?"

Jim could not hide his anxiety.

"They got the orders all right," said Haley.

Darrow walked out to the west end of the snow-sheds and watched down the cañon toward Shawano. At this place the train could be seen as it passed from below, before it started on the last steep grade of four miles.

He saw the smoke. Through the winter air came the whistle. It was pulling into Shawano. It stopped. Yes, it was switching. His cars were to be hooked on.

A big, warm current of exuberation swept over him. It was plenty of time. He was safe. His ore would be in the smelter-yards by nine o'clock at the latest. In the morning he would get the money and buy the mine.

He looked across at old Ouray, the giant mountain named for a brave old Indian chief. How still and terrible in its inaccessible grandeur! The world was young, and filled with far-flung beauty and stirring hope.

The labored *puff-puff* told that the freight was on the grade, bringing his precious cars of silver.

There was some delay; the climb was hard. But at 4.30 the freight pulled into the snow-sheds. It had begun to cloud, and was growing dark. The wind, too, had begun to roar from the northwest.

Darrow was glad the train was up that grade. It was down all the way from here to Salida. No fear the engine could not pull the load. Brakes were all that was needed.

Darrow climbed into the caboose. Five minutes, ten, fifteen passed, and no warning whistle signaled that the train was ready to pull out. Usually it took the car-inspector only ten minutes to go over the train.

Jim wondered what was the matter. He got out and stood near the steps of the caboose; he must not get left.

Two men were standing beside his first car of ore. By the lantern he saw it was the conductor and the new car-inspector.

Jim started toward them to learn what was the delay, when he heard the inspector say.

"Milligan, all these five cars are bad order. Cut them out. Nos. 1192 and 1047 have broken train lines; No. 9061 is off center; No. 9740 has a broken yoke, and this one is off center, too."

Jim stopped in his tracks. The conductor called to a brakeman, who uncoupled the caboose from the last car of ore, and signaled to the engineer.

They were switching his five cars of ore! The inspector had ordered them out of the train. The inspector's word was law.

CHAPTER IX.

DIRTY WORK AND DIRTY WEATHER.

DARROW'S mind made a swift circuit of the events of the last twenty-four hours.

It was all clear—glaringly clear. It was

not a hobo, but Corbin, hired by Mullins, who had crippled Nixon. This new car-inspector was in the employ of Mullins. That rascal had discovered his plans, and was bent on keeping that ore from the smelter until it would be too late

Jim ran stumbling down the dark shed toward the operator's office. Even as he ran he heard the engine backing his five cars of ore onto the switch.

"Haley!" he gasped. "They are cutting out my cars."

"Why?"

The operator had jumped up from his desk at Darrow's abrupt entry.

"Inspector has ordered them out. But, Haley, they are all right. If I don't get those cars to Salida to-morrow I lose a mine worth several hundred thousand. And the man who wants the mine has hired this new inspector for this job — I know it! What can be done?"

Haley bit his mustache and frowned.

"You believe the inspector is a tool of the fellow you lease from—"

"I know it," declared Jim. "And it was that bat-eared miner who crippled Nixon. He was hired by Mullins. You know, Haley, there would not be something wrong with all five of those cars."

"Wait!"

Haley went to his desk and began calling Gunnison on the telephone.

"Say, Jason"—the despatcher had answered—"get the superintendent; won't you? There is a new car-inspector up here, and he is pulling off a crooked deal on some good cars to keep ore from getting to smelter. I'm sure of it. Get the old man, and ask him to send an order for the trainmen to test the cars."

Haley turned back to Darrow.

"If the superintendent happens to be in, and believes what I say—and I think he will—we'll at least give this new man a once over."

He went to the door and out through the passageway into the sheds. The ore-cars were already switched, and the engine backing the rest of the train on the main track toward the caboose.

The conductor was not in a good frame of mind. He had had a lot of delays already. And cutting out these cars had not improved his temper.

"Say, Milligan"—the operator met him as he came back toward the caboose—"hold your train a few minutes. I'm looking for some other orders."

"Rats!" said Milligan. "I've had more orders now than I want."

"Well, you wait," said Haley emphatically.

He hurried back to the office. The despatcher was calling him. The superintendent himself took the phone.

"What's up, Haley?" he asked gruffly.

The operator explained the crippling of Nixon, the matter of Darrow's mine, and the new inspector's orders to cut out the ore-cars.

"Who is this new inspector?" asked the superintendent.

"A fellow named Burlett that the master mechanic sent up from Salida."

"Burlett. Seems to me I remember he had some trouble at Tennessee Pass. Call the conductor."

And from the way the conductor swore as he left the phone, Haley knew he had been ordered to inspect those five cars himself.

"Come on," the operator said to Jim. "We'll go, too."

He picked up a lantern and followed the conductor out.

"Here, you!" the conductor shouted to the car-inspector, who had started to his room. "Which of these cars did you say had a broken train-line?"

The inspector stopped and hesitated a moment.

"The two back ones," he said.

He started forward a little uncertainly.

"Why, what's up?"

"None of your business," snapped the conductor. "Go on in."

He ordered the engineer to hook on the two back cars and apply the air.

The train-line is an iron pipe that runs the length of the car underneath, near the middle. It carries the air that works the brakes. If it is broken the brakes clamp automatically, and cannot be released.

The connections were made and the air turned on. The conductor pulled the test-

ing rod at the side of the car. The air escaped. Then the brakes were tested, and set and released at will

To make sure, the conductor crawled under the cars. The train-line was in perfect condition.

"Well, I'll be blowed!" he said as he crawled out and went forward to the other three cars.

Two of them the inspector said were off center. They were not.

He went back and reported.

"Take them down," ordered the superintendent.

Once more Jim's spirit soared. Mullins had played his trump card, and by quick wit he had beat him

It took a half hour to reswitch the cars and get the train ready to start. The conductor came into the office to see if there were any further orders.

"No. 316 is to pass you here," said the operator.

No. 316 was the passenger-train due out at 7.05.

Jim was restless again, but not really uneasy. He went out to the end of the snow-shed to test the weather.

As he stepped from the shelter a wind caught him and hurled him ten feet into the darkness. He felt for the rail of the track, and fought his way back into the shed.

It was the wildest blizzard he had ever seen. The snow filled the air, and it was blowing seventy miles an hour.

He went back to the office scared again. As he entered, Haley was saying to the conductor of the freight:

"No. 316 is stuck down at Shawano —snow-drifts; ice on the track; they can't get up. Your engine is to take the flanger snow-plow down and help it up. They are ordering up an extra engine from Sargent."

"How long will that take?" Jim asked, worried lines in his face as the conductor went out.

"Heaven only knows," said Haley. "They will be lucky to get up at all in this blizzard."

"Does a storm like this often block the track?"

"Not often; but it has been blocked for a week."

Jim shuddered, and it was not from the howl of the wind that struck the window.

"They surely won't be stuck like that now"

His tone was desperate.

"I think not," said Haley. "I think they'll get up by ten or eleven o'clock."

At a quarter of twelve the three engines came snorting into the snow-sheds with the delayed trains, the passengers in various states of sleepiness, fright, and indignation at the delay.

In ten minutes the passenger-train pulled out.

"How long will it be until the freight starts?" asked Jim anxiously

"Not until they get clear down the grade," said Haley. "Probably an hour or two. But," he added reassuringly, "you need not worry now. They will break the track, and your train will have no trouble getting down before morning."

Jim drew a relieved sigh on the strength of the hope, and waited as patiently as he could

It was a quarter past one o'clock when the freight got orders to pull out

The storm was still howling as they crawled from under the protection of the snow-sheds. It was so dark and thick with the snow that even the outlines of the mountains were hid. The engine proceeded with great caution, creeping slowly down the steep grade and around the sharp turns. Every time the brakes squeaked louder and the train slowed up, Jim's heart began to pound.

"Any danger of this storm drifting snow enough to block the tracks?" he asked the conductor

"No. There is only one bad place for drifts—two miles below the Pass—and that is covered by snow-sheds."

As they turned the curve above the snow-shed the track was blown clear of snow, and the engineer let the train go a little. It sped up to fifteen miles an hour, and with two shrill warning whistles it plunged into the dark mouth of the snow-shed.

Half-way through, there was an impact

that sent the conductor and Jim sprawling on the floor. The train gave for ten, fifteen feet and came to a dull, dead stop.

"Rats!" said the conductor, scrambling to his feet and reaching for his lantern. "The top has blown off the snow-shed, and it has drifted full of snow."

"No!" said Jim, with furious rage. "The top has been *torn* off the snow-shed."

CHAPTER X.

BUCKING THE LAST LINE.

THEY got out with their lantern and, floundering through the snow and blizzard, explored the blockade.

Darrow was right. It had not been the wind that had unroofed the snow-shed. Men had done that—and they had done it well. Just past the sharp bend of the shed they had ripped off the roof for two hundred feet; just where the roaring northwest wind came swirling around the steep side of the mountain, rolling the loose snow down almost like waves.

They had timed it well, too—had let the passenger get through and then let in the snow. They knew that if the passenger was stuck the officials would make a hurried and desperate fight to open the track. But an irregular freight, with no perishable stuff, and no lives at stake—that would be no desperate hurry.

The snow in the hour between trains had rolled in until the whole shed was piled eight feet deep; and every swirl of the storm brought another three or four inches.

The engine had plunged into it at full speed, and was so buried that the boiler was cooled and the fire extinguished.

Jim said nothing, but followed the swearing conductor back to the caboose. The whole train-crew had gathered there, cooled up the iron stove, and were preparing to stretch out as best they could until daylight.

"Aren't you going to get back to the Pass and send word we are stuck?" asked Darrow.

"No," answered the conductor. "It can't be done. A man would be lost in this storm in ten minutes. When we don't show up at Salida, they will know something is wrong. Nothing will be done until daylight, anyway."

"How long will it take to get the train out when the snow-crew does come?" asked Jim.

"Oh, all depends on what luck they have," said the conductor. "That rotary snow-plow can cut through four miles of snow in an hour—if it doesn't strike anything. But the knives may get clogged, and have to be thawed out with a steam hose; or they may run into rocks and ice, and tear the knives off entirely, and have to go back to the shop for repairs.

"I was stuck over this side of Gunnison once for sixty-four hours. But," he added, "they'll probably try to get us out of the way by to-morrow night so the westbound passenger can get through."

"If they knew right away, wouldn't it save time?" asked Jim anxiously.

"Oh, it might save a couple of hours. But they'll guess what's wrong when we don't show up. I'll send a brakeman back at daylight, but it would be foolishness to start out in that storm. A man would get lost almost sure."

"I am going," said Jim.

The conductor and the crew tried to keep him, and called him all kinds of a fool. But he buttoned his coat close about his neck and started out.

The clouds had broken, but the wind was still blowing like a hurricane, and in places swooped down the mountain with a force that fairly sent him staggering from the track. But he felt his way back. His only hope was to follow the track. Once lost in the storm, death was certain.

It was only two miles back to the Pass—but it seemed like an icy slide half-way up the whole earth. The snow at places was nearly hip deep, and he had to flounder through.

The wind went through his clothes as though they were mere mosquito netting. He was numb; his breath, time after time, was taken from him by a gale of wind. But he fought on, up a hundred yards at a time.

At last, exhausted, half frozen, he staggered into the telegraph office. The operator, in bed in the adjoining room, was awakened by the noise of his stumbling entry.

"We are stuck in a snow-drift," Jim mumbled. "Get snow-plow."

With that he tumbled over on the floor

At eight o'clock Darrow was back at the train. The storm was over. It was still bitter cold, but the wind was down, and the sunlight was glittering over the snowy mountains.

Two hours passed, each one seeming to Jim like a life sentence, before the shrill whistle from down the grade told them the snow-plow was coming.

That had been been delayed at Salida – interminably delayed, it seemed. The master mechanic, the old veteran snow-fighter, was laid up with the grippe. The regular pilot of the snow-plow was sick, too. There was some delay in finding an experienced one to take his place.

Jim looked at his watch as the big rotary plow, pushed by three engines, came crawling up the grade toward the snow shed

The rotary plow is the final word in snow warfare. This one was twelve feet in diameter, with steel knives which cut the snow and threw it up and away two hundred feet from the track

The plow is run by an engine of its own, but must be pushed by other engines—from two to six, according to the deepness and hardness of the snow. In front of the snow-car, back of the plow, stands a pilot, who gages the speed and reverses the plow at will.

With a signal bell, he directs the engineer behind in his management of the car. One ring means "Stop!" two, "Go ahead!" three, "Back up!"

On the skill with which the pilot directs his plow depends the success of the drive against the snow.

Jim stood to one side and above the open snow-shed, watching the big plow tackle the great packed drift.

If they had good luck, it meant only a half-hour's work or less. Then the freight would be on its way, and there would yet be time enough. They could start at eleven and still be sure his cars were at the smelter before four.

The pilot signaled to go ahead. The three engines behind pushed forward. The great steel wheel struck the drift with a whir, and the snow went streaming out to the south like straw from the carrier of a giant threshing-machine.

Suddenly the machinery stopped. There was a signal to back up; the plow was clogged. The snow froze on the knives almost instantly. It took thirty minutes to thaw it out

It was eleven now.

Once more the plow started. Again it rushed the snow. Again it blocked and backed up

It was thirty minutes past eleven when the plow was again free and ready for the third attempt.

The pilot signaled to go forward. The snow began to fly; the plow was whirling right through the drift. Darrow's heart began thumping in warm, exalted hope. it would not take long now!

The great wheel, with its cutting knives, slowed. There was an impact. The plow was blocked.

A wild, hopeless rage went through Darrow, colder than the wind of the blizzard. Fate was against him. He would lose, after all. One more blunder like that by the pilot and it would be too late even to hope.

He counted off the minutes on his watch as they backed up and went—most leisurely, it seemed—to hooking on a hose and turning the steam on the frozen snow packed in the rotary plow.

Talk of the quick agony of a man seeing all his mistakes pass before his mind the moment before he drowns! That is nothing compared to the agony of a living man watching the slow, sure death of all his hopes for the future.

As Darrow stood in the wind and snow above the shed and looked down on the slow, bungling work of the pilot, while the precious minutes slipped by, there passed through his mind all those years of hope and failure, of struggle and futile effort. He had covered up his failure and his

gnawing ambition with lightness and jocularity, and all his people and friends thought he did not care—that he really wanted nothing but a cricket sort of life!

And then his opportunity came, and he had fought for it—fought through college, fought the mountains, fought the rascally mining men, fought cold and failure. And success—glorious success! more than he had ever hoped—was just in reach within twenty miles—within one hour—and now—and now that hope was being frozen there in that packed snow.

Once more the plow was free. The pilot nonchalantly climbed up the steps and went forward to his post; and the engineer followed him, taking the lever

"Ting! Ting!" went the signal. The engines behind the plow began to puff and move forward

As the plow approached the drift Darrow's heart beat so hard he could hardly breathe. This was the very last chance. If it failed to go through the drift this time, he was done for.

A moment the plow seemed rushing again—and Darrow, in bitter despair, turned his head away. But the whirring sound continued. He looked back, and the snow was streaming out of the hood as though a whole avalanche was being run through a shaft of compressed air.

Smooth and high the snow sailed, and the engine was moving forward foot by foot.

Darrow opened and shut his mouth. He swallowed hard to keep from choking. He looked from minute to minute at his watch. If it just held out twenty minutes more—ten minutes more—oh, now, if it just went five minutes more—

There was a signal for more speed, and his blood stopped half way in his veins. That was the rush signal that blocked the plow each time before. And then—how stupid he had been not to see it before—he knew that pilot was also a tool of Mullins, and had done this on purpose—and never meant to get through.

He ran to the edge of the shed and leaped down so close that he almost fell under the wheels of one of the engines.

He ran desperately forward to the snow-plow, leaped up the steps, and started to crowd by old Ben McCullin, the engineer, to get at the pilot down in front.

But as old Ben caught him by the arm, not seeming much surprised at his wild rush, Darrow perceived that the plow was still going steadily forward.

And he saw something else. Up at the end of the narrow foot board beside the boiler, which led to the pilot's place, stood another man—a slender man wrapped in a big overcoat, with a cap drawn over his ears

And this man held an exceedingly ugly gun against the pilot's back—just over his left lung.

Old Ben, seeing Darrow understood, released his arm and gave him a prodigious wink.

"She'll go through this time," he said reassuringly.

A steady *puff-puff* behind, a smooth, even rush—and out they shot through the end of the drift!

There was a yell of the trainmen behind—the yell of the fighters who have whipped in a struggle. And Darrow felt a queer, silent sort of exultation. It was two o'clock, and there was hope yet.

He stood still beside the engineer, watching the two men in front. The pilot, nervous, fearful, turned from his wheel, the gun still pressed against him, and marched back past the engineer and Darrow to the steps

"Jump!" said a low, imperious voice. "Jump and run." The pilot did it

But Darrow had jumped more at that voice than had the traitor pilot.

"Isonia!" he said, as she turned toward him and the old engineer.

The girl's face was white, but her eyes smiled.

"Don't let anybody but Uncle Ben know," she said, "that I'm not a man."

Ten minutes later the snow-plow backed to the switch. The freight whistled and started with clamped brakes to climb down the terrific grade.

In the caboose Jim sat in the corner of the car beside the young man who had saved him. His coat was still buttoned high, and cap pulled low.

"How did you know?" Darrow asked curiously.

"I've been watching their plotting."

"I can't— You don't know—"

Jim struggled with the inadequacy of words.

"You needn't," was the laughing reply.

The freight made all speed possible with any degree of safety. They rounded curves and rushed along the edge of precipices in a way that even made Jim willing for less speed.

From three o'clock on Jim looked at his watch every five minutes for half an hour; and then every two minutes it was in his hand. He had figured that if he got the cars on the track at 3.45, he would still have a chance to get a check from the superintendent and get to the bank in an auto before it closed. There was a savings-bank that stayed open until four.

If the bank closed he was lost; for there would be no possible way to get eighteen thousand dollars in currency — and Mullins would accept nothing he was not compelled to. A check is not legal tender.

It seemed an eternity from Mear's Junction; time can waste like sand from a sieve when one is straining to get somewhere. Minute by minute wasted away. It was 3.40—3.42! At 3.45 they were at the smelter switch.

Slowly, minute by minute, Jim's hope oozed from him and cold despair made him numb. It was 4.10 when the cars were switched, and he and the slender young man alighted from the caboose.

"Well, Isonia," he said despondently, as they walked across the smelter grounds, "it was wonderful for you to help me this way. You are a wonderful girl. It is too bad I had to fail after all. It seemed everything was against me."

She looked around at him; she had pushed back the cap until an edge of her soft, brown hair showed. The frost had stung her cheeks into a red glow; her eyes gleamed as though with suppressed news.

"You haven't lost, Jim," she said with a thrill in her voice. "The papers are all made out ready to sign. And Malone has the cash in his office, waiting for you."

"The cash—money—eighteen thousand dollars?" he said with a rush of hope.

He had stopped and stood looking down at the girl, who had played the boy to save him, as she nodded affirmation.

"And you did it all! Bless your darling heart! Honey, just wait until we get into a sheltered spot—if I don't hug you!"

Again her eyes twinkled mischievously. The color in her cheeks was deeper even than the frost justified.

"Why wait?" she said.

(The end.)

HOW WE ARE DOING "OUR BIT"

BY A. M. CORRIE,

Engineer, Atlanta Division of the Southern Railway.

THE locomotive that I now drive has been in my charge for four years and eight months. During that time as a result of the care and attention I give the working parts after completing my run it has never been sent to the shops for heavy repairs.

Altogether I have driven it over 272,000 miles without a breakdown. After each run I spend from thirty minutes to an hour going over each working part to see that no condition exists that may result in an accident or breakdown while out on the line.

By keeping my engine out of the shop and by consuming as little coal as possible in running it, I feel that I am contributing my part to the effort of my superior officers to produce the maximum transportation efficiency which is necessary to win the fight, and in doing these things to the best of my ability I think I am justified in the belief that I am doing my bit for my country in the present emergency.

On the Editorial Carpet

Where We Gather in the Hut, Tell Our Troubles, Help One Another, and Sing Some Old Songs.

FIRST TRANSCONTINENTAL RAILROAD.

If you were asked to name the railroad which above all others is worthy to be treated in the pages of the RAILROAD MAN'S MAGAZINE under the general head of "BIG RAILROADING," to continue the series so interestingly started by the Pennsylvania and continued by the New York Central, without a moment's hesitation, you would designate the first transcontinental railroad, wouldn't you?

Of course you would; and we quite agree with you.

And if you were asked to select the man best qualified to tell the story of that first transcontinental railroad, you would, with equal promptness, call for the foremost living writer on railroad topics, wouldn't you?

Why, certainly! Once more we fully concur in your excellent judgment. To be candid, we anticipated your wishes some time ago by asking Charles Frederick Carter to make the journey over that historic road from Omaha to San Francisco, being careful to stop wherever symptoms of good copy cropped out, and tell us about the Union Pacific and Southern Pacific, or "Central Pacific," to revert to the maiden name of the western end of that first transcontinental railroad

All railroads are interesting, but there never can be but one first transcontinental railroad, never another one, the history of which, from its inception to the present day, is so crowded with events, spectacular, thrilling, entertaining. Why, romance oozes from the very ties, and sings along the rails of the Overland Trail The present tense is used advisedly, for all the interesting things did not happen half a century ago by a long, long shot.

Carter was received with true Western hospitality, which is the most hospitable hospitality known to man From headquarters at Omaha, where Carter spent several days, to the lonesomest division points in the mountains, from the highest officials right down the line, the representative of the RAILROAD MAN'S MAGAZINE was given every facility and assistance in obtaining material Busy men, without qualms, put aside their work to tell him and show him everything that could possibly interest a well-behaved magazine reader.

More the chief engineer himself was so obliging as to go over parts of the manuscripts relating to his particular province, while other officers did the same with the copy about their own departments. So when Carter says it, you know it's so

Yet Carter never seeks to impart information by violence Believing that facts are not necessarily uninteresting, he tries to present them in their less funereal aspects. The result is that "his railroad articles are human and readable; and that is more than can be said of most railroad articles," to quote the words of a very widely known railroad officer

So the RAILROAD MAN'S MAGAZINE is proud to announce a series of six articles of extraordinary interest on the first transcontinental railroad, beginning in the April

number. By the way, Carter says he has never met a railroad officer who does not read the RAILROAD MAN'S MAGAZINE, and he has met many. What is good enough reading for a railroad officer, is good enough for other folk. Therefore, make arrangements right away to get every number of the RAILROAD MAN'S MAGAZINE.

FOLLOWING President Wilson's plea urging people to plant, plant, plant, the railroads scratched their heads in the effort to figure out how they could get into the crop-boosting game. And the scheme they evolved was ingenious, yet simple enough. They just allowed people who lived alongside the track to cultivate their rights-of-way clear up to the ballast-line. It's a good, human interest story, with lots of anecdotes and many unexpected developments, that Frank Kavanaugh unfolds on this subject next month

WHEN the express messenger receives a little memorandum marked "expense," it means that some article which passed through his hands has become damaged, and it's up to him to pay the amount specified unless he can pass the buck. Does he dig up? Ho! Does a cat swim? No, sir, he does not dig up so long as his strong right hand is able to grasp a pencil and fashion such exculpatory words as "leaking," "rattling," or "bad order." A. F. Harlow has a howlingly funny story about expressmen's ways of dodging expense.

AS Brer Mars, the god of war, takes the center of the stage, Brer Hobo, the god of vagabonds makes a hasty exit. In other words, the unpleasantness with Germany and her unsavory gang of yegg-men has resulted in Dusty Rhodes getting the hook. George Goode explains why next month. Is it a good thing or a bad thing that the tramp has disappeared? Well, read the batch of letters printed below, and make up your own mind

"OLD Times with the Soo Line" next month. This time the author is not "J. E. M," but one who camouflages his identity under the pen name of R. O'Head. These old-timers seem to be a flock of pretty cagey birds. "J. E M" and "R. O'Head"; what's the matter, you two? Afraid of getting pinched? Anyhow, you sure can tell bully good stories of railroading in the bygone days. And "Old Times with the Soo Line" is one of the best of the many papers of recollections which we have been privileged to publish

FICTION? Sure—good fiction, too. And departments. And verse. And jokes. And pictures—the next month's mag. will drip with pictures. Yes, we admit that the RAILROAD MAN'S MAGAZINE is as big a dime's worth as we know anything about

SNATCHED FROM THE MAIL-CRANE.

LET'S see, now, it was in the issue of April, 1917, that Samuel H. Paine wrote an article, entitled "Ditching the Hobo," which used Wandering Willie pretty rough Yes, sir, 'way back almost a year ago that article was, and still the letters are coming in about it letters of praise, letters of blame, letters of correction. So far every correspondent seemed to have missed the fact that Brother Paine was panning, not the harmless, wandering workman, but the dangerous yegg and the thuggish tramp. However, in spite of the long lapse of time since the article appeared, the subject is so still live that we're giving you a representative batch of letters by readers from all over, who view the subject from many angles. As for us, we're on the fence —astraddle at that.

I am a constant reader of your magazine, and have been for ten years. I have never written to you people before or found any fault; on the contrary, have always enjoyed your book; but I want to register a kick now at that poor, abused conductor from Syracuse, New York; also Mr. Paine.

Mr. Paine's article appeared in your columns some months ago with a flood of abuse on the poor "bum." I don't blame him, as writing is probably his business; but I do blame you people for ever printing such a bum story, and, furthermore, you paid him for it, too.

His story was unfair, full of prejudice, blamed the boes for everything, and gave them credit for nothing; and the chances are that he got every word of his material from the police records of different cities. Some writer—not; and from the flood of mail you got on his brilliant story, I guess a good many think the same.

Now comes this poor, abused conductor. Now listen, Mr. Editor, if the average trainman had just a fraction of the manhood and principle that the bum has, on the average, he would have something to brag about; as it is, the majority of them are just a mob of lantern cats, and are

generally considered so, not only when on duty, but in private life

Now listen, there is just a little bit of good in everything. Mr. Paine doesn't think so, but there is; also a little bit of bad. That rule applies to writers, bums, policemen, trainmen, editors, and presidents of the United States, or any other individual or institution, so don't let them knock the bum too much

There are probably just as many bums and ex-bums enjoying your book as there are railroad trainmen, so give them a fair deal

I was a bum six years myself once, and know a little about them

D. H NIEISWONGER.

Masonic Lodge,
Kansas City, Missouri.

So much has been said about "Ditching the Hobo," as Sam Paine puts it, that I would like to add my gentle plea, not for Mr Hobo, but dead against him.

For twelve years I have held positions as commissary man and cook in all parts of the country. In hard times many a hobo has been staked to a feed in my camp.

At one time when young in the game I used to boast that no bo ever was turned away. Many of the old school of hoboes remember me well as "Tom," of the F. E. C., the S. P., and roads in Mex.

But I am sorry to say that in twelve years' dealing with these knights of the cinder-path, I have yet to find one worthy of a crust of bread. Treat the bo square, and he goes off with everything that happens to be movable. Refuse him, and he wants to fight.

And now, considering the need of men by the government and the lack of labor on all the big jobs, in my humble way I would suggest that one year at hard labor would be a very good thing for these gentlemen of the road, whether caught riding the freights or walking the track

And another evil overlooked too often is men shipping on railroad jobs with no intention of going to work. At present I receive about forty men a week from a labor-office; bring them over two hundred miles on the train; give them two meals, and often the entire lot walks off together.

Once in a while I will find one out of ten that came willing to work. The law should be fixed to give these joy-riders at least a year in jail, and thereby clean up this class of bum.

Many boes will, no doubt, be surprised to find me lined up against them in this matter, but no bo will ever hit my door for a feed until he has worked for it from now on. This conclusion has been reached after years of contact with them

Don't feed the bo.

GEORGE B. THOMPSON.

West Albany, New York

Just a line or two about this thing that calls himself a hobo and passes off as a workingman Every man we see writing to you says he was a hobo once in his life. You will see by his writing he is always knocking the bum and the tramps

I want to tell you right from the start the hobo is the worst thing we have in the world today. Ditch the hobo is right. He likes to boast of the hobo being a workingman: "We build your railroads, look after your harvests," *et cetera*.

If the hobo was put off the face of the earth, a workingman would get good pay for what he is doing. The hobo is the greatest scab the world has ever known. No reliable company will employ him.

He will steal anything, from his friend's shoes to a workingman's dinner-pail. Stealing a workingman's dinner-pail is the worst crime that can be committed, but still this thing which is called hobo will say he is a workingman

He will rob cars, rob clothes-lines, steal from ice-boxes on the poor man's back porch; he will steal the clothes from the section-hands, from the wash-room of the coal-miners; he will steal the farmer's chickens, eggs, junk, brass, copper, and then say: "I'm a hobo, a workingman!"

Let me tell you, my dear friend editor, this thing hobo should be taken to the front and turned out with our guns. Make breastworks of them, and protect good men from shell-fire.

Jeff Davis, so-called "King of the Hoboes and Father of the Hotel De Gink!" If the New York police force would set fire to Hotel De Gink and send all the lodgers to Blackwell's Island, New York, they would be relieved of the biggest set of petty thieves that ever dropped in your city. He says hobo, not tramp or yegg, thank God!

The bum is not classed with that grease-ball that hides the crumb by posing as a workingman.

Jeff says he is personally acquainted with Mr. Lee, president of the B. of R. T. Did Mr. Lee stop at the Hotel De Gink that Jeff got acquainted with him?

Mr. Paine was right when he said: "Ditch the hoboes."

The tramps and yeggs do not ride on freights nor the head-end of a blind baggage. You will find them traveling just as any traveling man in this good old U. S. A., and not in a pair of overalls posing as a workingman if he is going to steal the shoes from the poor stiff, which Jeff's outfit will; and I can prove the hobo will do this.

Jeff says there are thousands of workmen throughout America prominent members of the Hoboes' Union. Yes; and they are all scabs. If you don't think this is true, just go to any shipping-office in the United States, and you will find all the hoboes with Hobo Union cards ready to take any man's job

Look through that bunch of hoboes and see if you can find a yegg, bum, or tramp trying to scab. No, Jeff, they don't scab. Why, say, Jeff, the I. W. W. ditched your band of scabs in the harvest-fields; you know this.

Jeff just finished his third trip around the world At that speed Jeff did not do all the hoboes

I am very sorry to hear that a man like Charlie Chaplin would say that he belonged to the Hotel De Gink outfit. If Chas. did, he did not know what kind of an outfit he was getting into.

Chas never was a hobo. Mr. Chaplin has been down, but never out; and I don't think he is guilty of any crime that he need pass himself off as a hobo

Once Jeff said: "Three times around the world with the set purpose of sifting out the hobo from the tramp." May God speed you, Jeff, in your set purpose, so the world will know what a hobo is made of

Let me tell you something about the bum. A bum is just a plain bum. When he is broke, he will bum you for the price of a feed. When he wants a ride, he will bum the brakeman for it When he wants shoes, hat, or coat, he will go to a doctor, lawyer, banker, or any man who can afford to give his old clothes away and ask or bum him for them.

He will not steal the shoes from his friend, nor will he steal from box-cars. It is just plain old bum. Do you see why the hobo is trying to class himself as a workingman? So he can get a chance to steal! No union would accept them as members. That is why hobo scab unions were organized Get me, Jeff?

You noticed the boomer tallow-pot did not call himself hobo, but said tramp. Now, old boomer, I myself am an old-time switchman.

Did you ever see a tallow-pot, switchman, brakeman, printer, mechanic that classed himself as a hobo? *I say no.* Take any one of these fellows when he is broke; he is not running around the country in a pair of overalls posing as a workingman.

So this said hobo makes the harvest-fields, the rice-fields in the South, does he? Well, last winter in Stuttgart, Arkansas, in the rice-fields of Arkansas the hobo stole all the brass from the engines and pumps around that town for miles. I know, as I saw them come in with the sacks and make the fire, heat the brass, break it up, take it out, and sell it to the junkman in Stuttgart. That very same man that went to work in the rice-fields, if he can work a week, he has all this stuff located

Then at night he will get it picked up. By the police he can prove by Mr. So-and-So that he worked a week. He hasn't the face to ask a man for help or bum a man for a feed

I am not going to speak of any one but myself. I have been a bum for twenty-six years. Jeff says a bum couldn't work if he wanted to. I lost my right arm ten years ago in the Erie yard at Passaic, New Jersey. Just to show you and the readers of this good old RAILROAD MAN'S MAGAZINE that a bum will work, just address:

Roy E. Fox's Popular Players, Box 171 Sulphur Springs, Texas; Huntington Minstrel Show (J. W West, manager), care of Cincinnati *Billboard*, Cincinnati, Ohio; J. R. Duggan, Y. M. C. W I. R. R., Sixty-Seventh Street, Chicago, Illinois; Dr. Garver Shoe, care of Cincinnati *Billboard* Company, Cincinnati, Ohio; Mr. Lee Parmarlee, 710 Baker Street, Flint, Michigan.

Then let us see if the bum will work. Hoping this will prove to you that bum is the right name for your boomers, and do not class yourself as a hobo. I am known by railroad men and show people from New York to Frisco as

C W N O. 1
(Chicago Wing No. 1).

Okmulgee, Oklahoma.

Am just down from western Saskatchewan, Canada. Got here in time to get the last two numbers of the RAILROAD MAN'S MAGAZINE. Happened to see the Master's Beggar's sheet. Couldn't help but say a few things when I saw that.

The idea of a man mooching ten bucks a day! I think he is a half-wise home-guard who has heard a bunch of boomer snakes talking. I'll bet he can't make ten dollars a week working.

The fact is, bumming is a thing of the past, these good times. Jeff Davis is a prince alongside of a four-flusher like this Hoosier.

Another thing in the magazine this time is "Tripping Down the Mississippi." The story just hits me, for I put in four years firing steamboats out of Memphis, Tennessee, on the Mississippi, and know more about it than De Soto did.

Spears surely has been down the river, for he has all the bends and landings down pat; and White River Landing—good night! Many a time I have taken that dirty west Kentucky coal there. Yes, I have been there from one end to the other. Well, I am not there now, and that settles it.

I am on the Lakes now, and an old rail or two on the same boat I am on. I wonder if any of the old-timers who worked with me on the Mop out of Scott City, Kansas, in 1910-1911 will see this. I was known as Ky out there.

J. A. P.
A Port in Ohio. (An old-timer.)

Seems like that "A No. 1" and "J B King" stuff never will down. Certainly many of your readers would like to know the truth of the matter, and many of them—old-timers like myself—are not satisfied to read the absurd claims by hoboes, tramps, and beggars looking for a little free advertising.

After A No. 1 had whittled his sign around a few of the principal railroads, it was a common sight to see any pen-knife artist at work on a first-class imitation until every section tool-house and water-tank (wooden ones) were decorated in a dozen places, and most of the work was done by the snakes.

It pleases me to see the prompt call-down Kentucky Slim hands our "master beggar" in the November issue. I don't think I could add anything to Slim's call-down. The master beggar is sure bugs.

I left Pennsylvania in April, '95. Had been running a yard for the Pennsylvania Railway in

the anthracite region, and we handled cars from all over the United States and Canada

You know what the Pennsylvania idea is—to send everything home loaded. At that time the Harrisburg yards were used as a sort of clearing house for foreign cars, and if anything from the west or northwest drifted into the country it would more than likely wind up in that vicinity, and from there to the coal-fields for a load home

And we loaded a few hundred of them every day. I have seen six hundred to eight hundred cars pass through Honey-Pot yard each way daily and never a J. B. King written on one of them.

When I reached the coast in '95 things looked rather rocky. The famous A R U. strike had been fought and lost, and their grand chief was in the pen for train-wrecking

The men who were working looked with suspicion on every one else. Newcomers (especially if they came from the East) were put down as scabs and spotters, and there were so many phony clearances in evidence that the office of the superintendent would hardly talk to a newcomer. But I had to go to work, and finally did get on the list

The first trip was Los Angeles to San Pedro. San Pedro was a little seaside town with some kind of a bay, and lumber-boats from up the coast used to pull in there and unload. There were several lumber companies in evidence, and they shipped to points in southern California, Arizona, and New Mexico generally

Our business was to take about forty foreign cars down to the little yard at San Pedro, spot the cars at the lumber-yards, and later in the day pick up the loaded cars, weigh them, and take them back to Los Angeles.

We had quite a little time to kill during the middle of the day, and after dinner I noticed one of the snakes going along the string of loads and writing J. B. King with a piece of chalk. He did it very cleverly, indeed, that monogram in chalk was a work of art.

I finally asked him who J B King was, and he said he was a foreman in a lumber-yard and he always signed his switch-order that way. This snake was a young fellow who was being put through the student stunt something that was new to me at that time—and he was handy with the chalk

I only held down the San Pedro run a few days, and then went out on the main line—Los Angeles to Yuma. While I had never seen J B. King on the side of a car before, it became very common, and I really believe it spread from that port.

I wonder if Slim didn't refer to San Pedro yard or Los Angeles yard. If he did, he had his dates mixed, for my story deals with the spring of 1895, not 1903

PLEASE DON'T PRINT NAME.

OLD-TIME TRAIN-ORDERS.

"IN your November number appears a train-order such as was issued in 1886," writes E. B. Clarke, of Athens, Ohio. "I am sending you a sample of an order such as was usual many years previous, also a copy of an order from a conductor to a despatcher, then designated trainmaster. The names of persons are fictitious; names of stations and of engine are real. Engines were named, not numbered. The Taft was named in honor of Alfonso Taft, father of the ex-President."

Good eye, Brother Clarke Glad, indeed, to get your interesting reproduction.

By the way, it might be as well to explain that in the early days of railroading a despatcher was promoted from among the conductors, as a telegraph operator was not then considered competent to hold down the bigger job, though instances will readily occur to old-timers wherein the despatcher was saved from errors by the operator. Well, to get down to the funny old train order:

SAMPLE TRAIN-ORDER, 1858-60

Conductor and Engineer Extra East, D N Run to Vincent, avoiding regular trains Avoid Engine Taft between Big Run and Cutler. Call for orders at Zaleski. Look out for car on main track East of Big Sand Keep your train well guarded, whistle around curves Answer —NORTON.

On the same road (Mr. Clarke writes further) a light engine was sent out from Cincinnati to Chillicothe with a train baggageman as conductor. (We will give him the name of Jackson.) Here is what he telegraphed to the trainmaster (despatcher) from Leesburg:

"NORTON, Ch·
"Hold all trains, for I am coming
"P. S. JACKSON."

All trains were held!

LAKEWOOD GETS A BOOST.

EVERY knock is a boost, and so is every boost Hence Arthur Lakewood, who is herewith glad-handed, should be doubly joyous. "Arthur Lakewood," by the way, is the pen name of a real, live, working railroad man

Gee whiz, that story by Arthur Lakewood, entitled "Seven Sections of Six," in the December RAILROAD MAN'S MAGAZINE ought to carry the green on the front end. I do believe it is the best I have ever read in the RAILROAD MAN'S MAGAZINE

Mr. Lakewood has evidently seen some of the real railroad life, and made a mental note of what he saw. There is real life in his story —the kind I think every railroad man likes to read

I should like very much to hear from Mr Lakewood again, and I am sure all red-blooded boys of the rail would also. A vote of thanks to Mr Lakewood

ARCHIE GILFILLAN.
1441 Page Street,
San Francisco, California.

SONGS BY BARDS OF THE RAIL.

THE TRACK-WALKER.

WITH head bent low and shoulders stooped,
And slow, down-looking eye
Fixed on the rail, a silent shape,
The track-walker goes by.

A five-mile strip of shining stone,
Edged with an iron band,
Is all his world. Cold snows that drift
In blizzards o'er the land

He heeds not, nor the autumn rains
That rustle down the air,
Rail-bolt and bar to keep in place—
This is his only care.

He steps aside a moment
Ere the rushing train flies past,
Then stoops, while yet the gravel whirls,
To make a loose bit fast

Morn is to him a starting-point
To tramp through sun and rain;
His noon a place to turn and start
Back to his home again.

A ceaseless traveler, all his days,
New lands he ne'er may roam;
In yonder orchard is his house,
Here 'twixt the rails his home.

Unmourned, unmissed, he dies to find
The last lone miles all trod—
But whoso walks a railroad track
Aright, has walked with God.

—*Railroad Association Magazine.*

A COMMUTER'S POCKETBOOK.

ON mornings cold, like these, I glow
With vim and aspiration
As on the eight thirteen I go
Past station after station.

I never get a chance to look
At papers or to smoke, for
I'm delving through my pocketbook
To placate the conductor.

My ticket, somewhere in the folds
Of that infernal leather
Lurks, hidden by the trash it holds
All jumbled up together.

A recipe for julep and
Some golf scores of the leaders,
A whist hint, "How to Play Your Hand,"
And "Court Warns Motor Speeders."

A canceled check, a broken pin,
Some fish-hooks tied with cotton,
A note from Hoyle on "How to Win
At Poker" (but it's rotten).

A few old notes, a bid to dine,
And "Spanish Conversation,"
Some keys, a place to go for wine,
A tract on "Man's Salvation."

Conductors glare, my trainmates smirk,
While I wax hot and gritty
Believe me—all I do is work
Until we reach the city.

—*Philadelphia Ledger.*

MUSINGS OF A RAILROAD MAN.

WHEN I am through with the railroad crew
And my grandson climbs to my knee,
I know full well what he'll bid me tell,
And the queries he'll fling at me.

He'll want to know of each mighty blow
That I struck in the martial fray,
And what is more—how I won the war?
And I wonder what I shall say.

I must confess the truth, I guess,
And admit I was left behind
I was a "pa" and must care for "ma"
And things of a kindred kind.

I must admit that my bravest "bit"
Was not very brave at all,
You'd call it slow, for I worked, you know,
The fellow behind the wall.

All that I did was to do as bid,
The things I was told to do;
Of course that meant my savings went
For the old Red, White and Blue.

I sent across the Blood Red Cross
To follow my own two boys.
But only in heart did I know in part
Their sorrows and their joys.

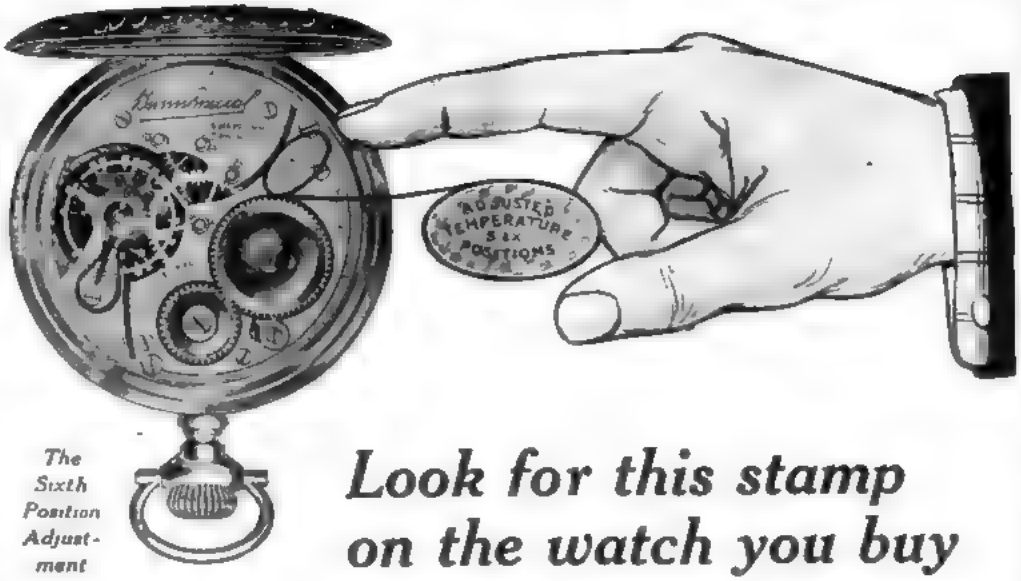
I worked unseen in a great machine,
A single cog in the wheel,
That brought the bread, the meat, and lead,
And furnished the winning steel.

I helped to tote from plain to boat,
And we answered prompt to the call;
I fought my fight with my labor's might,
But I won no medals at all.

I'd like full well to up and tell
The things he would like to hear,
Of battles won and brave deeds done,
But it isn't for me, I fear.

It's hard to stay behind this way,
But I'm yielding to Sam's command.
I'll tell the kid that's all I did,
And perhaps he will understand.

—*Southern Pacific Bulletin.*



The Sixth Position Adjustment

Look for this stamp on the watch you buy

Then you can't go wrong in buying your watch.

You need the best there is NOW.

It may be required LATER.

Originally, railroad watches were not adjusted to positions.

Later, three position adjustments were required.

Now, the inspectors are not allowed to pass any watches adjusted to less than five positions.

For the present five position watches are standard.

But railroad requirements are continually going higher—not lower.

So why take any chances on a five position watch when you can just as easily get the superior

Sangamo Special *and* Bunn Special

ILLINOIS watches which are adjusted to temperature, isochronism and SIX POSITIONS?

Ask your jeweler for these watches

ILLINOIS WATCH COMPANY, Springfield, Illinois

Five Months to Pay

Have the snappiest, best tailored suit—and take five months to pay for it. Fit, style and workmanship guaranteed. Choose from finest fabrics in plain colors, stripes, checks, plaids Send now for wonderful 1918 Style Book (in colors) which shows latest fashions and explains our easy credit plan. Cloth samples sent also—free with the Style Book.

Tailor-Made-to-Order

Yes—made from your own measure and tailored by experts. Return the suit to us if not satisfactory. No risk to you at all. The suit must satisfy you or we lose. So you see we must make it right we must give you the biggest value. You decide it all yourself and we accept your decision.

$1000 Reward in gold to anyone who can prove that we do not actually make every garment to order from the customer's measure.

As Little As A Dollar Down

No big deposit. Only a little as evidence of good faith—and that back if you don't keep the suit. Just look over the free Style Book and samples and you will be amazed that we can make such an offer. Try this way. See how well you can dress without feeling the cost. Pay a little each month while wearing the suit. Get all the facts as explained in our Style Book sent free on request.

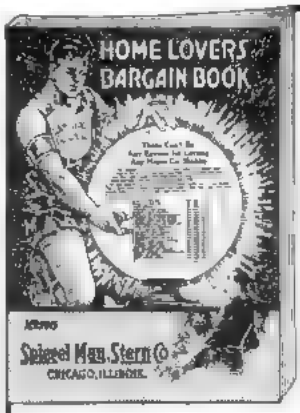
Save $15 to $25

Our big volume of business and selling direct to the customer cuts down the percentage of operating expense. We save our customers from $15 to $25. Compare with the local tailor's suits and see for yourself

FREE Style Book and Samples

A very remarkable book Pictures in exact colors show just how you will look Get posted on what is correct A l prices and terms given too The Stanley Rogers plan fully explained. Send post card now for this wonderful Style Book and the samples all sent free.

Stanley-Rogers Co.
1615 Jackson Blvd., Dept. 356, Chicago



FREE Dollar Book

Our latest Bargain Book of furniture is now ready. It pictures an enormous collection of lovely things for the home at half usual prices. Its page is nearly twice as big as any other catalog. It shows a great many things in actual colors. **All are sold on credit.** It is free to you—*now.*

See Furniture Before You Buy

Just tell us what you want and we will loan it to you for a whole month on free trial. If you don't like anything, just pack it back to us.

Take Your Time to Pay

We open your account when we send you our book. We give you home things immediately and let you pay for them as you use and enjoy them. We gladly wait for our money. You send us only a small part of the bill as you get your money.

Prices Like Memories

Our present stocks were bought many months ago. But the quantity is limited. When they are gone we will have to raise our prices. We are printing only enough catalogs to sell out these stocks. **Get your copy now.**

SPIEGEL, MAY, STERN CO., 921 W. 35th St., Chicago

ON 30 DAYS FREE TRIAL

Any Watch You Want

Elgin—Waltham Illinois-Hamilton and South Bend in Rich Gold Cases

Send No Money!

We smash the terms—
We boost the quality—
We lower the price—

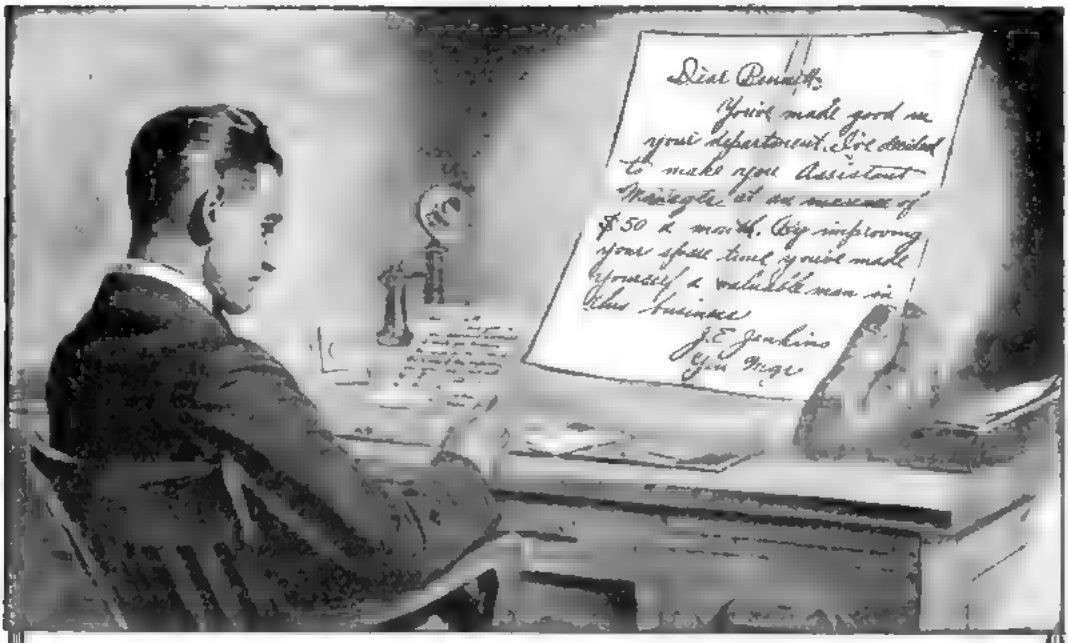
Easy Credit Terms As Low As $1.50 A MO.

Just tell us the watch you want. We have it for you. We will make you a lower price and more liberal terms than any other House in the country—in fact, our **confidential bedrock prices** will surprise you. Or merely send your name and address and we will send you our Free Catalog and Monthly Cut Price Bulletin, showing all kinds of Watches, Diamonds, Jewelry, etc

Sent on Approval You do not risk a cent. Every article guaranteed Your selection will be sent on 30 days' approval No red tape—No security—No Interest—a square deal for square people, and those who buy this month will be given a $3.00 chain FREE.

HARRIS-GOAR CO., Dept. 341 Kansas City, Mo.
We Do As We Advertise.

In answering any advertisement on this page it is desirable that you mention RAILROAD MAN'S MAGAZINE


Dear Bennett:
You've made good in your department. We decided to make you Assistant Manager at an increase of $50 a month. By improving your spare time you've made yourself a valuable man in this business.
J. E. Jenkins
Gen. Mgr.

"Promoted Again!"

"Why, that's my third advance in a year! Taking the I. C. S. Course certainly was the best thing I ever did."

Every day more men are reaping their reward for spare time spent in study with the International Correspondence Schools. You will find them in offices, shops, stores, factories, on railroads—in every line of industry. They are winning advancement and increased salaries because they planned ahead and got ready for bigger work.

What about you? Wouldn't you like to know the thrill of promotion after promotion, of having important work put up to you, of being a big man in your field, of enjoying the money that a big job pays? *You can!*

Right now, with the war making ever increasing demands upon our country's industries, employers are combing their ranks for men who can handle responsible work, for men they can *promote*. By doing your present work well and by training yourself now for the job ahead, you can do your part towards serving your country and at the same time put yourself in line for advancement.

The training you need is easily within your reach. The International Correspondence Schools stand ready to help you prepare for success just as they have helped hundreds of thousands of others in the last 26 years.

You can get this training in your own home, by mail. You don't have to lose a minute's sleep, a single meal, or an hour's pay. You prepare in spare time—time that might otherwise be wasted.

Don't hesitate. Don't put it off. Right now opportunity is playing a return engagement. It offers you again the chance you have neglected so long. Your opportunity is in this coupon. Don't turn it down. Use it. Fill it in—mail it today. You'll never regret it.

TEAR OUT HERE

INTERNATIONAL CORRESPONDENCE SCHOOLS
BOX 5972, SCRANTON, PA.

Explain, without obligating me, how I can qualify for the position, or in the subject, *before* which I mark X.

- ☐ ELECTRICAL ENGINEER
- ☐ Electric Lighting
- ☐ Electric Railways
- ☐ Electric Wiring
- ☐ Telegraph Engineer
- ☐ Telephone Work
- ☐ MECHANICAL ENGINEER
- ☐ Mechanical Draftsman
- ☐ Machine Shop Practice
- ☐ Gas Engine Operating
- ☐ CIVIL ENGINEER
- ☐ Surveying and Mapping
- ☐ MINE FOREMAN OR ENGINEER
- ☐ Metallurgist or Prospector
- ☐ STATIONARY ENGINEER
- ☐ Marine Engineer
- ☐ ARCHITECT
- ☐ Contractor and Builder
- ☐ Architectural Draftsman
- ☐ Concrete Builder
- ☐ Structural Engineer
- ☐ PLUMBING AND HEATING
- ☐ Sheet Metal Worker
- ☐ Textile Overseer or Supt
- ☐ CHEMIST
- ☐ SALESMANSHIP
- ☐ ADVERTISING
- ☐ Window Trimmer
- ☐ Show Card Writer
- ☐ Sign Painter
- ☐ Railroad Trainman
- ☐ ILLUSTRATING
- ☐ Cartooning
- ☐ BOOKKEEPER
- ☐ Stenographer and Typist
- ☐ Cert. Public Accountant
- ☐ TRAFFIC MANAGER
- ☐ Railway Accountant
- ☐ Commercial Law
- ☐ GOOD ENGLISH
- ☐ Teacher
- ☐ Common School Subjects
- ☐ Mathematics
- ☐ CIVIL SERVICE
- ☐ Railway Mail Clerk
- ☐ AUTOMOBILE OPERATING
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- ☐ Navigation
- ☐ AGRICULTURE
- ☐ Poultry Raising
- ☐ Spanish
- ☐ German
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Name _____

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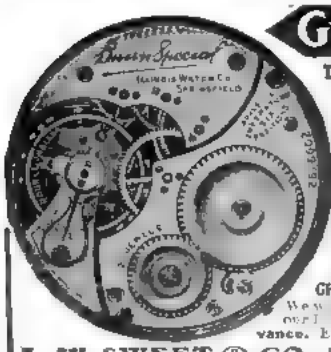


Guaranteed Railroad Watch ON CREDIT

THE FAMOUS BUNN SPECIAL, GUARANTEED TO PASS EVERY INSPECTION

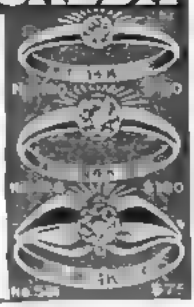
Why pay retail dealer prices for a Standard Railroad Watch? Save money through our **Direct to you** easy payment plan! We will sell you the celebrated Bunn Special Lever Set, **21 jewels**, adjusted to **6 positions**, Montgomery R. R. Dial 14k Gold filled case at less cost, on small monthly payments than you pay for cash price.

NO MONEY IN ADVANCE

Examine it carefully. If you don't like it send it back! **It won't cost you a cent.** You are the sole judge! If the watch suits you pay a little down and the rest in easy monthly payments—**a few cents a day.** You wear the watch while paying for it. **No Security—No Red Tape.** You get it at once. We trust honest people all over the world. Our **Great Watch Offer** is explained in our **FREE BOOK**, the

GREATEST WATCH, DIAMOND AND JEWELRY BOOK EVER PUBLISHED

We sell you any Standard Watch, Diamond or other article of Jewelry on our liberal, easy payment plan. **FREE EXAMINATION. No Money in Advance.** Everything at Rock Bottom Prices. Send for your copy. Write today.



L. W. SWEET & CO., INC., DEPT. 2-H, 2 and 4 MAIDEN LANE, NEW YORK CITY

"THE WORLD'S GREATEST DIAMOND MERCHANTS"

BANG-UP STORIES! Absorbing tales for leisure hours—romance, adventure, fun; brimming measure in the

ALL-STORY WEEKLY. *Ten cents*

buys the best bet in fiction magazines. On all news-stands every Thursday—fresh and zestful with stories of life, love and laughter. *Get it to-day at any news-stand*

THE FRANK A. MUNSEY COMPANY - - 280 BROADWAY, NEW YORK

WONDER Pipe Bender

Patented

One of the Greatest Labor and Money-Saving Devices Ever Placed Before the Public

Will bend—COLD—perfectly and quickly, without heating, filling, cracking or crimping, all sizes of standard gauge and double thick wrought iron, steel, copper and brass pipe.

USED by the UNITED STATES, BRITISH, CANADIAN and FRENCH GOVERNMENTS and such well-known concerns as

Stone & Webster, Contractors, Boston, Mass.
Western Elec. Co., Boston, Mass.
Gen. Elec. Co., Schenectady, N. Y., and Lynn, Mass.
Atlantic Refining Co., Philadelphia, Pa.
American Locomotive Co., Schenectady, New York.
Aberthaw Construction Co., New York.
Pacific American Fisheries, So. Bellingham, Wash.
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Manning, Maxwell & Moore, Jersey City, N. J.
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3 models: 1-8" to 1"; 3-8" to 2"; 2 1-2" to 4".

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Manufacturers, railroads, jobbers—all our great business organizations need, **must have** men who know how to handle the intricate problems of transportation. The employment of an expert means the saving of thousands of dollars, the facilitation of freight movements, the equitable adjustment of claims, and often the salvation of profits. The man who can handle the interstate commerce of a business therefore commands an expert's salary. He has practically no competition because, where there is one capable man, there are scores of organizations which need this service.

Over 500,000 concerns are directly affected by the laws and decisions governing the shipment of merchandise. More and more these organizations are realizing their necessity for the highly trained man. Railroads also need more men with broad knowledge of transportation problems. The Interstate Commerce Commission needs them. Cities and Chambers of Commerce need them. One city alone in the Middle West pays its traffic expert a salary of $10,000.00. States are employing men skilled in this field to act in the interests of their shippers. The demand is constantly growing. This is one uncrowded profession.

If you are dissatisfied with your present position or if you now know something about traffic but want to add to your knowledge, send for particulars about the Interstate Commerce, Railway Traffic Course and Consulting Service, given by LaSalle Extension University.

You will study under a staff of practical experts who have been through the actual work they will teach you—men who have occupied or are now occupying responsible positions with leading railroads or shippers. You will get in a few months the knowledge which they acquired by years of experience.

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U. S. Steel Corporation	250
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Ford Motor Company	162
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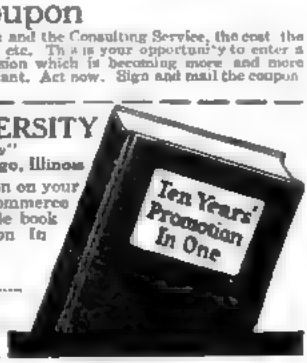
Please send me your books and full information on your Course and Consulting Service in Interstate Commerce and Railway Traffic. Also a copy of your valuable book for the ambitious man, "Ten Years' Promotion In One." This without obligation on my part.



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is creating a sensation in musical circles. Investigation will convince you that never has a grand piano with the prestige and quality of the Vose sold at so low a figure $575, F. O. B. Boston. Before buying a piano learn more of this wonderful instrument.

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I know because I was Deaf and had Head Noises for over 30 years. My Invisible Anti-septic Ear Drums restored my hearing and stopped Head Noises, and will do it for you. They are Tiny Megaphones. Can not be seen when worn. Easy to put in, easy to take out. Are "Unseen Comforts." Inexpensive. Write for Booklet and my sworn statement of how I recovered my hearing.

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The Standard Railroad watch that is GUARANTEED FOR LIFE. These watches are NOW in the service on practically every Railroad in the United States. Santa Fe Special watches are in every branch of the Army and Navy service. Thousands of them are distributed all over the world. They are **GUARANTEED ABSOLUTELY, TO GIVE SATISFACTION IN EVERY WAY OR MONEY BACK.**

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Save ⅓ to ½ of Your Money

Not only are you saving money from the present day prices of watches but you can still secure the "Santa Fe Special" watch at LESS THAN PRE-BEFORE WAR PRICES.

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Clip the coupon, fill out and receive the free watch book right off the press. All the newest watch case designs are shown. Read our easy payment offer. Wear the watch 30 days Free. Watch sent for your examination and approval without a penny down. Nothing to risk. See the watch before you buy.

SANTA FE WATCH CO., Dept 31, TOPEKA, KANS.

Home of the Great Santa Fe R. R.

A letter, a postal or this coupon will bring the Free Watch Book

SANTA FE WATCH CO. Topeka, Kansas. Dept. 31.

Please send me the New Watch Book with the understanding that this request does not obligate me in any way.

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Does The Socket Chafe Your Stump?

If so, you are NOT wearing

Buchstein's Vulcanized Fiber Limb which is soothing to your stump, cool, neat, light, walks not much thicker than a silver dollar, strong.

Guaranteed 5 Years.

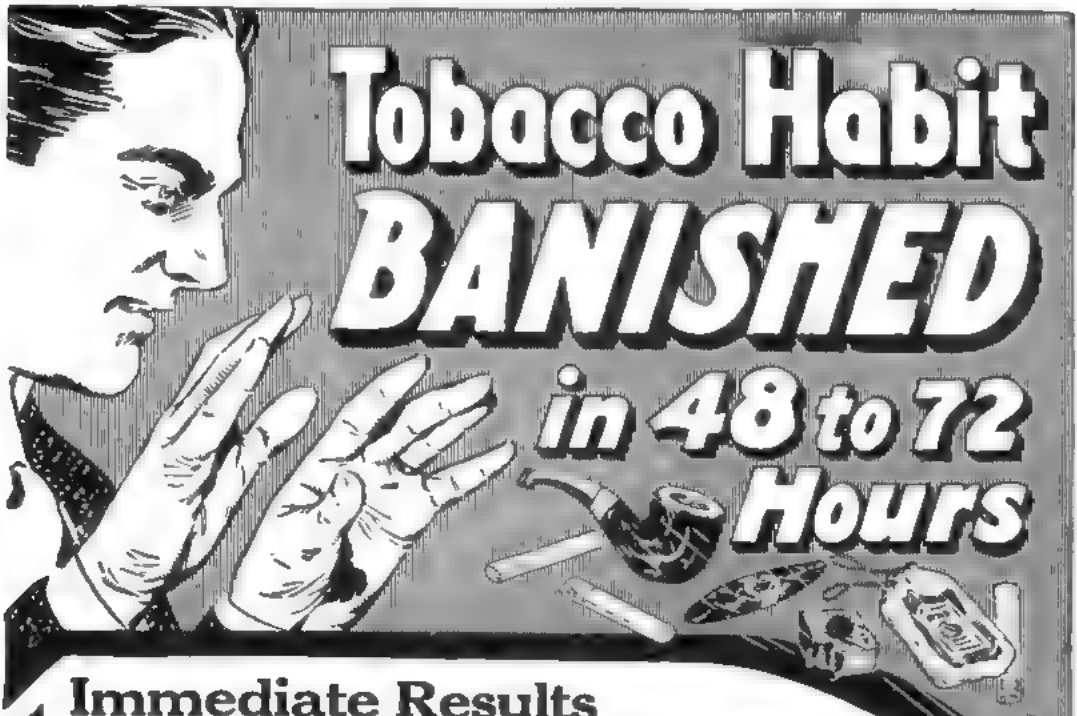
Sold on easy payments to good people.

C. Buchstein Co., 113 6th St., S., Minneapolis, Minn.

LE PAGE'S GLUE

HANDY TUBES

A HOUSEHOLD NECESSITY



Tobacco Habit BANISHED in 48 to 72 Hours

Immediate Results

Trying to quit the tobacco habit unaided is a losing fight against heavy odds, and means a serious shock to your nervous system. So don't try it! Make the tobacco habit quit you. It will quit you if you will just take Tobacco Redeemer according to directions.

It doesn't make a particle of difference whether you've been a user of tobacco for a single month or for 50 years, or how much you use, or in what form you use it. Whether you smoke cigars, cigarettes, pipe, chew plug or fine cut or use snuff **Tobacco Redeemer** will positively remove all craving for tobacco in any form in from 48 to 72 hours. Your tobacco craving will begin to decrease after the very first dose—there's no long waiting for results.

Tobacco Redeemer contains no habit forming drugs of any kind and is the most marvelously quick, absolutely scientific and thoroughly reliable remedy for the tobacco habit.

Not a Substitute

Tobacco Redeemer is in no sense a substitute for tobacco, but is a radical, efficient treatment. After finishing the treatment you have absolutely no desire to use tobacco again or to continue the use of the remedy. It quiets the nerves, and will make you feel better in every way. If you really want to quit the tobacco habit—get rid of it so completely that when you see others using it, it will not awaken the slightest desire in you—you should at once begin a course of **Tobacco Redeemer** treatment for the habit.

Results Absolutely Guaranteed

A single trial will convince the most skeptical. Our legal, binding, money-back guarantee goes with each full treatment. If **Tobacco Redeemer** fails to banish the tobacco habit when taken according to the plain and easy directions, your money will be cheerfully refunded upon demand.

Let Us Send You Convincing Proof

If you're a slave of the tobacco habit and want to find a sure, quick way of quitting "for keeps" you owe it to yourself and to your family to mail the coupon below or send your name and address on a postal and receive our free booklet on the deadly effect of tobacco on the human system, and positive proof that **Tobacco Redeemer** will quickly free you from the habit.

Newell Pharmacal Company
Dept. 319, St. Louis, Mo.

Mail Coupon NOW for FREE Booklet

NEWELL PHARMACAL CO.,
Dept. 319, St. Louis, Mo.

Please send, without obligating me in any way, your free booklet regarding the tobacco habit and proof that **Tobacco Redeemer** will positively free me from the tobacco habit.

Name .....

Street and No .....

Town ..... State .....

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B8

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This Lesson in 5 Minutes

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Try the Specimen Lesson Here:

Here's \ p and thig is ○ s Write the two together, and you have \○ ps Here's (th To make path you simply write ⌒ and with these two easy movements of your pencil, you have made a word that needs 16 pencil movements when written in longhan

Here's | t so it is easy to write ⌒. st, ⌒ tap and ⌒ pat.

Already you have learned four K.I. Shorthand signs you won't forget.

With the other signs and easy directions you can learn to indicate every word in the dictionary in quarter to twentieth of the time required in ordinary writing, as rapidly as words are spoken!

Guarantee You Can Learn

If you learn the above in 5 minutes you should learn the whole K. I Shorthand within 5 hours, after which you develop speed with ordinary practice. Hindrances of old systems eliminated, no shading no positions no vowel symbols no word rules no positions — you can read your notes readily months or years after. Hence K. I Shorthand is valuable for private notes messages, etc.

Taking notes in K. I. Shorthand

Free Brochure

"Talk as fast as you like. I am taking it down in K. I. SHORTHAND."

In order to prove to you the superiority of K. I Shorthand we would like to send you **FREE** this new brochure, [illegible] and further information about this system. **K. I. SHORTHAND** is [illegible] and we are ready to pay $5.00.00 for a system superior in merit and standing. Fill out or copy the coupon below and mail to us promptly. You will be surprised and delighted

(Mention this magazine.)

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In Sunny Italy

the patriarchs used to smoke long silver filigree pipes. How hot and cumbersome! How happy they would have been to have gotten hold of a modern Wellington!

You can fill up your Wellington Pipe with a generous load, and draw cool, clean, dry smoke to your heart's content. There is no wheezing or bubbling. No crumbs of tobacco can come through that stem. The "well" attends to all that. All you get is smoke—distributed away from your tongue by the upward bore of the bit.

Wellington

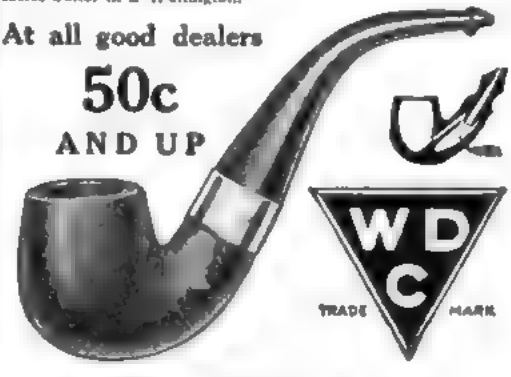
THE UNIVERSAL PIPE

is made of genuine French Briar, seasoned by our own special process. It breaks-in sweet and mellow. The bowl is guaranteed against cracking or burning through. Look for the W. D. C. triangle trademark—the sign of supreme pipe value for more than 50 years. Pick up your shape and size in a Wellington and be pipe happy. Any tobacco tastes better in a Wellington.

At all good dealers

50c

AND UP



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World's Largest Pipe Manufacturers

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Are Different Overalls

There Is a Reason

Go to Your Dealer

and ask him to show you a Signal TubTesT non-shrinkable overall. If he does not carry them, send us your size and we will send you a pair on approval.

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A sure look for this trade mark—it's the "Safety First" sign in buying overalls.

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I Smash the Terms

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Practically unlimited terms to suit you. No red tape, no fuss of collectors. I trust you absolutely. You have a regular OPEN "CHARGE" ACCOUNT. The same kind of credit you get from your grocer when you deal with me.

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Big book of bargains in cameras and supplies. All goods sold on 10 days' Free Trial. Money back if not satisfied. You take no chances dealing with us. We've been in the photographic business over 20 years. **Write now**

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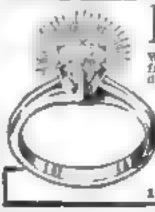
—Every Deaf Person Knows That

I make myself hear after being deaf for 25 years, with these Artificial Ear Drums. I wear them day and night. They are perfectly comfortable. No one sees them. Write me and I will tell you a free story, how I got deaf and how I make you hear. Address

Medicated Ear Drum Pat. Nov. 3, 1908

GEO. P. WAY, Artificial Ear Drum Co. (Inc.)
123 Adelaide St., Detroit, Mich.

Pay As You Wish



We'll send you a genuine Lachman gem for 10 full days free trial. Put it to every diamond test you wish. Let diamond dealers make all the tests they can to prove it. If you can tell it from a diamond, return it and it costs you nothing. If you decide to keep it, pay as you wish. Write now.

Set In Solid Gold

Lachman terms keep the credit ring free for you. The newest mountings in all kinds of jewelry. Write today for free new jewelry book and catalog.

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DIAMONDS WATCHES ON CREDIT

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LOFTIS PERFECTION DIAMOND RING

The most popular Solitaire. Each diamond is specially selected by our diamond experts, and is skilfully mounted in our famous Loftis "Perfection" 14 karat solid gold 6 prong ring, possessing every line of delicate grace and beauty. A Genuine Diamond is the best investment into which you can put your money. It constantly increases in value and lasts forever. Every article listed in our Catalog is distinctive in richness and elegance no matter what the price.

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Our Special Low Prices

Every article in our Catalog is specially selected and priced direct to you. With stores in leading cities, and our extensive Mail Order House our large purchasing power puts us in position to make prices which are impossible for small concerns to meet.

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Prove It At My Expense

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Bunions are different from corns, callouses, or other foot troubles, and require entirely different treatment. Reasoning will tell you that any plaster claiming to cure all foot troubles will probably cure none, because what is good for corns is not good for bunions.

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It is a wonderful yet simple home treatment which relieves almost instantly the pain. It reduces the cause. Use as directed. Instead of shoes, appliances, all this while you are wearing your ordinary shoes with perfect comfort. I know it will do all I say and more. I am willing to send for "Fairyfoot" FREE to anyone because I know when you have used it and seen what it has done for you, you will be glad to tell your friends about it and tell them to send their name and address to "Fairyfoot" and I will be sure to get your letter. I will send you a treatment, together with my valuable booklet on Foot Troubles. Write today.

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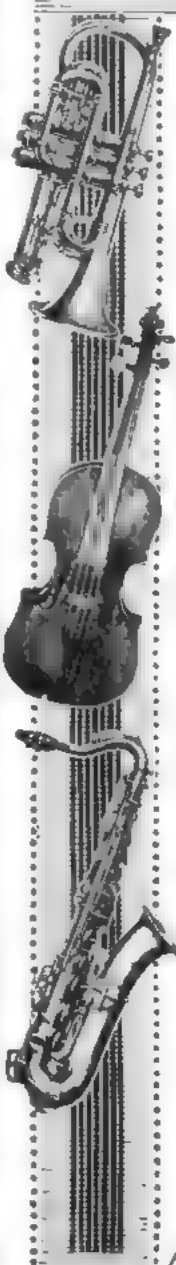
10 Cents a Day



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On this great special offer you have over 2000 instruments to choose from. *Any one of these will be shipped to you for one week's free trial in your own home.* The Cornet, Violin and Saxophone illustrated here are but three out of the thousands of remarkable offers that we make.

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But first put your name and address on the coupon now and get our big, new catalog absolutely free. Just state what instrument you are interested in and we'll send you the big 176-page book free and prepaid.

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The Rudolph Wurlitzer Co.
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East 4th Street, Cincinnati, Ohio
South Wabash Ave., Chicago, Illinois

Gentlemen:—Please send me your 176-page catalog absolutely free. Also tell me about your special offer direct from the manufacturer.

Name .....

Address .....

I am interested in .....
(Name of instrument here)

The Railroad Man's Dollar

Do you get as much for your dollar as you think your dollar should buy?

The Railroad Man's Dollar page is an honest effort on the part of the publishers to give you practical information as to where you can purchase the article you may want—an automobile, or a collar—to the best advantage.

Naturally, this service is **free** and is **yours** for the asking.

THE SEASON THAT IS NEAR

It is almost time to put a little gas in the car, turn it over a few times to see where the kinks are, to start digging out the old shotgun, the fishing rod, and the hip boots, the baseball outfit, ball, bat, mitts and your club suit, or perhaps your wheel or motorcycle. —The boat will have to be gone over, painted and gotten ready for the water.

Now, what are you going to do about it? Perhaps, you have a complete outfit for your favorite sport. Maybe you will need new parts, or even new gear all through. Either way, we would like to help you buy the things you need and as a favor to you.

Your local dealer may have what you want; if he has, he is the man to go to. The point is that you have some good cold cash in your pocket that you want to spend for some particular object, and, of course, you want the best, or the most your money will buy.

We will put you in touch with concerns that have just what you want at the price you want to pay, whose stocks are large, whose goods are standard.

We can tell you where to buy a motor boat, a carburetor, or a propeller. If it is a reel, a hamper, or a fly, motorcycle tires, side car or the whole machine, or in fact any article you want to buy—look over the advertisements in this magazine, and if you do not find what you are after, fill out the coupon and mail it to us.

We Can Help You Buy Any of These Things

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Firearms
Food Products
Fountain Pens
Fraternal Insignia
Furniture
Gloves
Gun Clubs
Gun Powder
Hand Traps
House Furnishing
Investments
Jewelry
Lamps
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Marine Engines
Motorcycles
Motor Boats
Musical Instruments
Musical Instruction
Overalls
Patent Attorneys
Phonographs
Pianos
Pipes
Pocketbooks
Poultry
Railroad Books
Salesmen's Courses
Shoes
Silverware
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Watches
Wearing Apparel
Wireless Outfits

Write name of each article together with name and address plainly in coupon below

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The Railroad Man's Dollar Department, 280 Broadway, New York, N. Y.

Gentlemen

I am considering the purchase of the following articles, and would like to have your information and advice

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. . . . . .

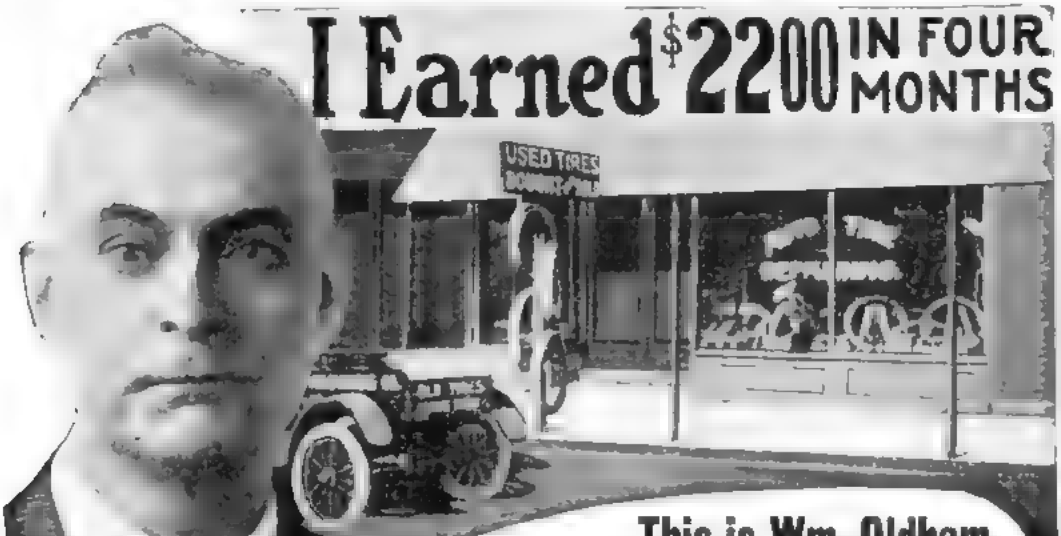
. . . . . .

Name . . . . . Occupation . . . . . .

Address . . . . . .

8-13

I Earned $2200 IN FOUR MONTHS



This is Wm. Oldham

Mr. Oldham was telegraph operator for the Illinois Central Railroad for twenty years. He is fifty-eight years old. During all those twenty years, he drew the customary monthly salary of a telegraph operator—no more—no less. One day he read one of my advertisements and the possibilities of making money in the Auto Tire Repair Business. In a few weeks, he had purchased and installed a Haywood outfit, and was doing business for himself. He was **His Own Boss.** A short time ago he wrote us that his income in four months was as much as it had been in Two and One-Half years as Telegraph Operator.

You men who have been left at home—who are beyond the draft age, can and must take up the burdens left behind by others. Oldham is a living example of what can be done. There are **thirty million** tires in use every day—punctures and blow outs are common. Something going wrong all the time. New tires advancing to prohibitive prices. Owners forced to have their old tires fixed. I have 500 places to be filled now. 500 stations where tire repairing is neglected, because there is no one to do it.

I Must Have 500 Men

to fill these places within the next 60 days

I have a big interesting book to send you—a book about tires—it tells all about them—how they are repaired by the Haywood method—explains this business—gives inside figures and profit. Gives actual proof of success—letters of others who are now operating Haywood Shops and making big money. What these men have done you can do. $2500 to $4000 a year is conservative.

One machine will give you a start. You can see business around you—everywhere there are automobiles there are tires that need repairing. You know that. All you do is open a shop—put out a Haywood sign, and auto owners will come to you, welcome you and the service you bring them. If you haven't seen the "Sign of the Man and Machine" there is a big opportunity awaiting you.

Sign the coupon and mail it today, or send a post card or letter.

M. HAYWOOD, Pres.

HAYWOOD TIRE & EQUIPMENT CO.

766 Capitol Avenue, INDIANAPOLIS, IND.

M. HAYWOOD, Pres.
Haywood Tire & Equipment Co.
766 Capitol Avenue, Indianapolis, Ind.

DEAR SIR: Please send me your book on Haywood Tire Repair and full particulars on your Natural Tire Repair Service and details of your FREE school of tire repairing.

NAME .....

ADDRESS .....

134 Final Inspections by Men Paid to Find Fault

Before leaving the factory each "ROYAL" Typewriter is critically inspected for the most minute defects. Every screw, nut and link must be properly set and tightened without mutilation. There can be no binding at any part, no interference and no side play where there should be none. Thin paper must feed without wrinkling or turning its edge; six sheets of paper, with carbons, must feed without slipping.

The high standard set for "ROYAL" Typewriters permits of no compromise. Every part of the "ROYAL" must look and act as it should. Only absolute perfection is tolerated. We refuse to risk the "ROYAL" Typewriter's reputation by hurried, final inspections.

So, inspectors in the "ROYAL" factory are judged by their expertness in detecting inaccuracies and ordering them corrected.

It is impossible to be sure of having bought the best typewriter without knowing the variety of work that the "ROYAL" does and how perfectly it does everything. Write, telephone or call for a demonstration at our nearest office or branch.

ROYAL TYPEWRITER COMPANY, INC.

MAIN OFFICE: 364-366 Broadway, New York

FACTORY: Hartford, Conn.

Branches and Sales Offices in Principal Cities All Over the World

ROYAL

"U. S. Protection"

When you wear sturdy U. S. Rubber Footwear, feel the comfort, find how well and how long it will wear, realize how it saves your money—you'll know what we mean by "U. S. Protection."

Heavy service, double duty, warm, dry, comfortable feet always, everywhere, are assured those who wear "U. S." There's a special style to suit every work and worker—outdoors. All bear the "U. S. Seal"—trade mark of the largest rubber manufacturer in the world.

Look for this seal —your protection.

UNITED STATES RUBBER COMPANY US RUBBER SYSTEM AND ASSOCIATED COMPANIES

For sale everywhere. Your dealer has the style you want, or can get it for you.

United States Rubber Company

New York

U. S. Rubber Footwear

Our 21 Jewel SMASHES PRICES

Look!

- 21 Ruby and Sapphire Jewels—
- Adjusted to the second—
- Adjusted to temperature—
- Adjusted to isochronism—
- Adjusted to positions—
- 25-year gold strata case—
- Genuine Montgomery Railroad Dial—
- New Ideas in Thin Cases.

Only $2.50 A Month

And all of this for $2.50—only $2.50 per month—a great reduction in watch prices—direct to you—positively the exact prices the wholesale dealer would have to pay. Think of the high-grade, guaranteed watch we offer here at such a remarkable price. And, if you wish, you may pay this price at the rate of $2.50 a month. Indeed, the days of exorbitant watch prices have passed.

See It First

You don't pay a cent to anybody until you see the watch. You don't buy a Burlington Watch without seeing it. Look at the splendid beauty of the watch itself. Thin model, handsomely shaped—aristocratic in every line. Then look at the works! There you will see the masterpiece of the watch makers' skill. A perfect timepiece adjusted to positions, temperature and isochronism.

Every fighting vessel in the U. S. Navy has the Burlington Watch aboard. Many have over 100 Burlingtons—a few over 200. This includes every torpedo boat—every submarine as well as the big Dreadnaughts.

Burlington Watch Co.
19th Street and Marshall Blvd.
Dept. 1093 Chicago, Ill.

Please send me (without obligation and prepaid) your free book on watches with full explanation of your cash or $2.50 a month offer on the Burlington Watch.

Name .....

Address .....

Send Your Name on This Free Coupon

Get the Burlington Watch Book by sending this coupon now. You will know a lot more about watch buying when you read it. You will be able to "steer clear" of the over-priced watches which are no better. Send the coupon today for the watch book and our offer.

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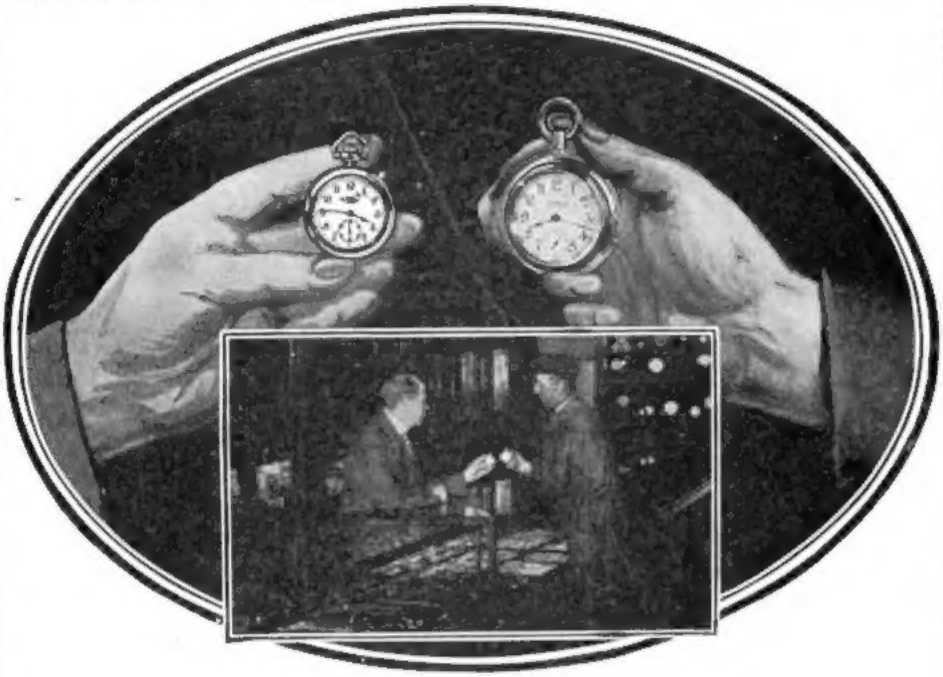
BALL WATCHES

OFFICIAL RAILROAD STANDARD



Trade In Your Old "Wood Burner"

HERE are the hands of Jeweler Bern and Engineer Pickard. One holds the new 16 size Twentieth Century model Ball, the other holds the "wood burner", the thick, heavy, cumbersome, inconvenient 18 size watch.

It's a "trade-in" the men behind the hands are talking over. With just a little to boot Engineer Pickard will leave his old watch and walk out with a new.

There are, as you know, a great many railroad men now carrying an old 18 size watch. Every one of them should be talking over this "trade-in" proposition with his home Ball Watch jeweler.

If you are carrying a "wood burner" why not go in today and see how easy it is to make a trade?

The Webb C. Ball Watch Co., Cleveland, Ohio

CHICAGO—Garland Building SAN FRANCISCO—Flood Building WINNIPEG—Confederation Life Building

Bc

The 21-Jewel Burlington

Look!

21 Ruby and Sapphire Jewels—
Adjusted to the second—
Adjusted to temperature—
Adjusted to isochronism—
Adjusted to positions—
25 year gold strata case—
Genuine Montgomery Railroad Dial—
New Art Designs—Extra Thin Cases.

$2.50 a Month

The superb 21-Jewel Burlington watch, with all these exceptional features, sold direct to you at the rate of only $2.50 per month. Positively the exact price the wholesale dealer would have to pay us. Think of it!—Only $2.50 per month for this high-grade guaranteed watch *direct* at a remarkable price.

Mail Coupon Today!

Get the Burlington Watch Book Free by sending this coupon now. You will know a lot more about watch buying when you read it. You will be able to "steer clear" of the over-priced watches which are no better. Send coupon today.

A Real Man's Wrist Watch

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Please send me (without obligation and prepaid) your free book on watches with full explanation of your cash or $2.50 a month offer on the Burlington Watch.

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